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NOTES ON MYCOLOGY DURING 1918.

By W. N. C. Belgrave.

As usual, the diseases of rubber have taken up nearly the whole time of the mycological section, those reported on other crops being few in number and of little importance.

Rubber.

Brown bast.—The work of greatest importance during 1918 was the study of brown bast, unfortunately, without positive results. In view of the importance and difficulty of the problem it was decided by Government and private employers to pool the available labour, a meeting of scientific officers interested in the problem was therefore held in July, and the Brown Bast Investigation Committee was formed. The co-operation thus achieved has been of undoubted value, and considerable time has been saved especially in the collection and co-ordination of field observations and in the carrying out of field experiments.

Although the disease remains the most serious attacking rubber in Malaya, a general survey to the end of 1918 suggests that the fears entertained by some of widespread devastation to be wrought by it have not been realized. There can be no doubt that a high percentage of the alarming total of cases discovered in 1917 were old cases which had remained unnoticed before. The factors leading to discovery in that year were:

(*a*) The large number of estates which were for the first time tapping on renewed bark.

(*b*) A better knowledge of the disease.

(*c*) The widespread thinning out which took place, leading to the concentration of attention on individual trees.

The two last factors should be non-recurrent. No statistics of the rate of increase, i.e., of occurrence of new cases as distinguished from discovery of old ones were obtainable in 1917, but general observations suggest it to have been higher than in 1918. Observations of burred trees on some old estates also suggest the occurrence of epidemics in the past.

During the first half of the year, attempts to demonstrate a causal organism, commenced in 1917 were fruitlessly continued. Many bacteria (including the organism mentioned in the *Agricultural Bulletin, F.M.S.*, Vol. VI, No. 1, which was either a lowly alga or a green bacillus) and some fungi were isolated from

different samples. They were then inoculated into healthy trees without any result other than the production in a vertical direction of a small amount of the yellow "wound gum" associated with brown bast. This gum was also produced in many control experiments, and its presence cannot be taken as a certain indication of brown bast.

No more successful were attempts to demonstrate an organism in the affected tissues; in addition to various staining methods, the gold chloride impregnation method successfully used by Erwin Smith in demonstrating the organism of crown-gall was tried.

Attempts at inoculation of healthy trees or unaffected parts of diseased trees with brown bast tissue itself completely failed, and taken in conjunction with the failure to isolate or demonstrate an organism suggested that brown bast was a non-infectious disease of physiological origin. With the approval of the Brown Bast Investigation Committee, work for the latter half of 1918 was physiological in character. This work still continues.

Contemplated experiments with fertilizers could not be carried out, owing to the impossibility of obtaining the required manures.

Black-stripe (*Phytophthora* sp.).—There have been no serious epidemics of black-stripe during the year. The climate of Malaya with its alternation of heavy rain with fierce sunshine is not well suited to black-stripe, and, although the disease may be expected to appear during abnormal spells of rainy or overcast weather, it is unlikely to prove a serious menace provided reasonable precautions are taken during such weather. The precautions necessary are prompt cessation of tapping on diseased trees and efficient preventive painting of all trees in the affected areas. The most popular preventive paints have been Izal, 3 per cent.; Brunolinum, 8-10 per cent.; and Brunolinum plantarium, 4-5 per cent. Formalin-bisulphite gave good results on some estates, but failed on others.

Further work was done on the causal fungus, especially with a view to its relationships with the fungi causing similar diseases in South India and Burma.

Mouldy-rot (*Sphaeronema* sp.).—Like black-stripe, mouldy-rot was held in check by weather conditions till the end of the year, when outbreaks occurred in the originally infected areas, and in one new area—Kuala Pilah. This extension coincided with a migration of tappers, and illustrated the necessity which exists for careful sterilization of knives brought to an estate by coolies.

The disease does more damage and is more difficult to treat and prevent than black-stripe. Difficulty of prevention is largely due to the great numbers of spores produced, and to the powerful resistance to drought of one of the spore forms.

In connection with "stripping" as a treatment for brown bast experiments showed the stripped surfaces to be ideal media for the growth of "mouldy-rot" and planters were warned against extensive stripping in affected areas.

The preparation of a special bulletin on black-stripe and mouldy-rot was started.

Cladosporium sp.—During the drought in the early part of 1918, a greenish-black mould appeared on recently tapped surface in some few districts. This proved to be a species of *Cladosporium*, and was, as anticipated, not serious, and was amenable to tarring.

Somewhat extensive damage was done on one estate by a canker, which appearing first as very fine black vertical hair-lines, caused the death of large areas of recently tapped bark. The cause remains obscure.

Branch, Leaf and Pod Diseases.

Pink disease (*Corticium salmonicolor*).—This disease gave no special anxiety in 1918.

Die-back.—Following the drought mentioned above, many estates suffered from yellowing and falling of leaves, followed by die-back of branches and in some cases of trees. The fungi isolated were *Diplodia* sp., *Gleosporium* sp., *Colletotrichum* sp., *Cytospora* sp., and *Helminthosporium* sp. The first cause of trouble was ascribed to drought, and this was borne out by failure of any of the fungi described or of diseased material to produce infections, and by distribution, the affection was worst on shallow soils, where the lateral root development is great. With the return of normal weather, the trouble disappeared.

Leaf-fall and pod-rot (*Phytophthora* sp.).—None has yet been recorded, although at the time of the leaf-fall mentioned above, careful search was made.

The climate of Malaya is probably unsuited to this form of *Phytophthora* attack, but as a measure of precaution, the importation of rubber "plants" from South India and Burma was prohibited.

(A similar prohibition was placed on "plants" from South America, where South American leaf disease *Melanopsammopsis ubi* is known to occur.)

Daedalea sp.—Two cases of trees attacked by a soft "heart-rot" starting from the stumps of broken branches, yielded a fungus belonging to the genus *Daedalia*, which on inoculation reproduced the disease. It is unlikely to become serious, but shows the necessity for careful treatment of snags on valuable trees.

Root and Collar Diseases.

There is nothing special to report. Clean clearing continues to make good progress.

The "wet-rot" fungus originally described as *Poria hypolateritia* (Berk) was provisionally named *Fomes pseudo-ferreus* (Wakef). This fungus does not appear to occur in Ceylon, and serves to illustrate the necessity which exists for disease work to be carried out in each rubber-growing country.

Other Crops.

Diseases on other crops identified or investigated were *Gleosporium* sp. on pepper, *Sclerotium* sp. and bacteria on an imported variety of castor oil, *Ustilaginoidea* sp. on padi, bacteria on sireh.

Dr. Butler, Imperial Mycologist, India, spent four months in the Federated Malay States, and very kindly gave much valuable information enabling comparisons to be drawn between fungus diseases and conditions in India and Malaya.

NOTES ON THE WORK OF THE INSPECTION STAFF DURING 1918.

By A. G. G. Ellis.

The following visits of inspection were paid to estates :

	Estates visited.	By request.	More than once.
Chief Agricultural Inspector ...	41	37	2
Assistant Agricultural Inspector, Perak	55	19	6
Assistant Agricultural Inspector, Negri Sembilan	50	10	—
Acting Assistant Agricultural Inspector, Johore	31	20	1
Acting Assistant Agricultural Inspector, Selangor	21	6	4
Total ...	198	92	13

Most of the visits of inspection paid by request were in connection with bark diseases. On certain of the estates visited more than once, experiments dealing with the prevention and treatment of bark diseases were carried out.

Points of Interest in Connection with Estate Inspection.

Bark diseases have continued to attract a large amount of attention. On the whole it may be said that mouldy-rot was less abundant than it was in 1917. Black-stripe has become very common, and even now many planters seem to be unaware that it is a notifiable disease. Preventive painting is now the rule rather than the exception on estates where the disease has been found.

Brown bast has been found on almost every estate, and a great many managers have tried one treatment or another on an experimental scale, while a number have gone in for such work on a large scale. The presence of this disease has caused most managers to adopt a cautious attitude when considering the question of thinning out.

Points of Interest in Connection with the Inspection of Small Holdings.

For the most part the owners of small holdings now maintain their properties in better order. The various Assistant Agricultural Inspectors have spent much time on instruction work, which, combined with a certain number of prosecutions, will, in time, effect a decided improvement.

Numerous complaints have been received from estate managers regarding the condition of native holdings in their neighbourhood. For the most part the instructions have been attended to more or less satisfactorily. It is somewhat difficult to enforce the clearing up of some holdings, because this would have meant considerable hardship. In several cases, land overgrown with lalang and blukar had been abandoned, and was resumed by the Government, being subsequently given out to others and cleaned up.

The results of lalang and blukar cases are as follows:

State.	No. of cases.	Results.		Fines.		Total.
		Convicted.	Acquitted.	Maximum.	Minimum.	
				$	$	$
Perak	42	40	2	20	2.00	260.00 with costs
Selangor	67	61	6	10	2.50	306.50 „
N. Sembilan ...	7	6	1	3	3.00	18.00 „
Pahang	25	24	1	3	1.00	53.00 „
Total ...	141	131	10	20	1.00	637.50

During the year many notices were served, requiring small holders to remove dead rubber and coconut stumps, while several instances of very bad tapping had to be attended to. Owing to the scarcity of firewood, in some districts miners removed much surface timber and dead trees from kampongs, for which a small price had to be paid. Unfortunately, many fruit trees were cut down and sold at the same time. It is difficult to get small holders to realize the necessity for thinning out their rubber holdings, although a few of the more progressive ones have made a start in this direction.

The result of cases taken to Court for failure to remove dead rubber trees or to treat bad tapping wounds are as follows:

State.	No. of cases.	Results.		Fines.		Total.
		Convicted.	Acquitted.	Maximum.	Minimum.	
				$	$	$
Perak	20	11	9	15.50	1.50	44.50
Selangor	16	12	4	100.00	5.00	340.00
Pahang	6	5	1	3.00	2.00	12.00
Total ...	42	28	14	100.00	2.00	496.50

Miscellaneous Items.

On 20th June as the result of correspondence between the local Committee of the Rubber Growers' Association and the Director of Agriculture, Mycologists from all parts of the country met at the Department of Agriculture Buildings to discuss investigations and treatment of brown bast. The Brown Bast Investigation Committee was formed with the Chief Agricultural Inspector as Chairman and the Economic Botanist as Honorary Secretary. It was resolved that the Committee should meet quarterly. A definite scheme of investigation work was prepared.

A simple article on bark diseases was written by the Chief Agricultural Inspector for translation and publication in the *Malay Bulletin*.

A circular letter to estate managers asking for information in connection with brown bast was prepared by the Acting Mycologist and the Chief Agricultural Inspector and after being passed by the Advisory Committee was sent out.

The Chief Agricultural Inspector gave eight lectures and demonstrations in the Federated Malay States and Johore on bark diseases and treatment of brown bast by the stripping method. The Assistant Agricultural Inspector, Johore, gave two lectures and demonstrations in his State on the same subject.

Rubber Diseases and Pests.

A.—stem diseases.

Pink disease (*Corticium salmonicolor*).—The number of estates on which this disease has been known to occur is shown in the following table:

State.	Recorded in 1918.	Previously recorded.	Total.
Perak	9	136	145
Selangor	5	35	40
Negri Sembilan ...	—	43	43
Pahang	—	4	4
Johore	—	7	7
Total ...	14	225	239

In Perak, the disease has been found in most mukims. A very few cases have been found in Kinta during the year. Up to date only one case has been reported from Stiawan, while in Krian the disease is more commonly met with than in previous years. In Selangor pink disease seems to be spreading very slowly but is confined for the most part to the district of Ulu Selangor. Most estate managers now know that this is a notifiable disease.

In native holdings, pink disease is a little better attended to than in previous years, but much remains to be done. Court cases have been less numerous, possibly because in some districts heavy fines have been imposed. In several instances, coolies have been employed to treat affected trees, and the cost of treatment recovered from the owners.

The result of Court cases are as follows for pink disease:

State.	No. of cases.	Results.		Fines.		Total.
		Convicted.	Acquitted.	Maximum.	Minimum.	
				$	$	$
Perak	173	121	52	200	1.50	1,137
Selangor... ...	6	5	1	150	.50	500
Negri Sembilan...	1	1	...	25	25.00	25
Pahang	16	15	1	10	3.50	88
Johore	9	9	...	50	10.00	410
Total ...	205	151	54	200	.50	2,160

In Perak of those entered as acquitted, 21 cases were ordered to pay costs only and seven were withdrawn.

Die-back (*Diplodia cacaoicola*).—No serious outbreak of this disease was recorded during the year.

Thread blight.—Several cases were found in kampongs in Perak, especially in mixed plantations. Very little damage was done to rubber trees on estates.

B.—BARK DISEASES.

Mouldy-rot (*Sphaeronema* sp.).—During the year under review, this disease was less prevalent than in 1917. There have been, however, several bad outbreaks with a gradual spread in certain directions. Towards the end of the year an outbreak occurred near Mambau and another in the kampongs near Kuala Pilah. It was found necessary to forbid all tapping on certain native holdings and this closing down during wet weather seems to be the only way of dealing with the disease on such places.

Mouldy-rot has been found on or reported from seven estates for the first time during 1918, making a total of 25 estates. It should be borne in mind that this is a notifiable disease.

Black-stripe.—This is a notifiable disease, but it is certain that many estate managers have not yet reported its presence on their estates. This disease has been found on or reported from estates as follows:

State.	Recorded in 1918.	Previously recorded.	Total.
Perak	34	20	54
Selangor	7	15	22
Negri Sembilan ...	2	11	13
Pahang	—	3	3
Johore	4	—	4
Total ...	47	49	96

In Perak, black-stripe has been found in kampongs in several districts, and the managers of several estates have supplied disinfectant solutions free to the poorer of the owners of rubber holdings on the boundaries of the estates.

Brown bast.—The Brown Bast Investigation Committee formed during the year is endeavouring to find the cause, treatment and prevention of this trouble, but up to date little information has been obtained. The stripping and scraping method of treatment both have their strong supporters, and both methods seem to give good results if the work is carefully done on trees on which the affection has not advanced very far. Both methods have their disadvantages however, the chief of which are, in the stripping method, the liability of the renewing bark to be attacked by moulds, and in the scraping method, the difficulty in determining when all affected tissue has been removed. In the mouldy-rot areas it is not considered advisable to strip.

Patch canker.—This disease has been found on a number of estates, and has caused the managers thereof much worry and work.

C.—ROOT DISEASES.

Fomes lignosus.—This disease is well known, and with the exception of affected trees on native holdings, cases are promptly and carefully treated.

Brown root disease (*Hymenochete noxia*).—This disease is frequently confused with *Fomes* and is generally treated on estates as such.

Sphaerostible repens.—This disease is frequently found on old rubber, but during the year no serious damage was reported.

Ustulina Zonata.—This disease is found in most old planted areas, and, in addition to root and collar attacks, several cases have been observed on stems and branches, following neglected pink disease, wind damage and bad pruning.

Fomes pseudo-ferreus. Formerly known as *Poria hypolateritia.*—This disease has done no extensive damage during the year, although a few trees have been killed by it on many of the older estates.

OTHER DISEASES.

Pod disease.—This rot of fruits was less common than in 1917.

Leaf fall.—There were numerous reports of leaf fall from various districts, during the prolonged drought in the latter half of the year. The leaf fall was usually followed by a dying off of young twigs and smaller branches. This trouble appeared to be the outcome of the drought, as it disappeared when the rains became plentiful.

PESTS.

White ants.—These continue to do considerable damage especially in peaty soils.

Leaf mite.—This pest is more plentiful and does much more damage than is generally recognized. Quite a lot of damage was done in one or two districts to young stump plants.

Stem borers.—These have done no extensive damage during the year. Trees damaged by leaf or other fires are liable to attack, as are those treated for brown-bast in very dry weather. Care should be taken to remove, as soon as possible, any trees that may have to be thinned out.

Padi.

There was an outbreak of a leaf hopper pest in Krian in January, which at one time threatened to be serious, and steps were taken to carry out on a large scale the recommendation of the Entomologist, for its control. This work became unnecessary as the natural enemies of the pest got the upper hand, and, with the possible assistance of heavy rains, so controlled the pest, that no further damage was done.

An outbreak of another padi pest was reported from Pekan during the last week of the year.

Stem-boring caterpillars and sucking insects did a small amount of damage causing dead and blind ears, while rats and birds did serious damage wherever the padi ripened irregularly.

Water Hyacinth.

Perak North continues to be the most badly affected part of the country. The Assistant Agricultural Inspector, Perak, has devoted much time to this pest.

In Krian the Kurau River was cleaned up twice at no great expense, but will require to be again gone over early in the year, as will be the abandoned padi area at Sungei Gedong which was cleared up by contract. The Sungei Brieh and Sungei Samagaga are being cleared up by contract. The District Officer and the Executive Engineer are engaged in removing this plant from alienated land, irrigation ditches and drains.

In Larut and Matang, State land has been cleaned repeatedly, but young plants continue to spring up and require removing.

The Perak River valley has been cleared carefully as far downstream as Bota, but will require to be gone over again early in the year to ensure that the district is clean.

In Kinta, the Sungei Plakat and the neighbouring swamps have been cleared up by contract as has been the abandoned mining block at Kota Bharu. The Sanitary Board, Kinta, will undertake the eradication of this pest within Sanitary Board areas.

In Perak, the Assistant Agricultural Inspector has had several blocks of alienated land cleared, and has recovered the costs from the owners of the land.

No damage has been done by this pest plant in Selangor or Negri Sembilan.

The following water hyacinth cases were taken to Court:

State.	No. of cases.	Results.		Fines.		Total.
		Convicted.	Acquitted.	Maximum.	Minimum.	
				$	$	$
Perak	6	6	...	20	3.50	58.50
Negri Sembilan...	5	5	...	...	...	Costs only
Total ...	11	11	...	20	3.50	58.50

Coconut Pests and Diseases.

Beetles.—No extensive damage was done by beetles during the year, but it must be borne in mind that if permission is given by the Collector of Land Revenue to cut out trees, they must be destroyed immediately. One neglected tree may serve as a source of infection for a whole district, as is evidenced by the fact that the Assistant Agricultural Inspector, Perak, found in one tree, five years old, 42 adult red beetles and 79 grubs—a total of 121. Rhinoceros beetles do a considerable amount of damage as well as red beetles and an effort should be made to prevent an increase in their numbers, by destroying any substance in which they are likely to breed.

Brachartona catoxantha.—A small outbreak occurred in Bagan Datoh but no extensive damage was done. What is probably the worst attack ever known occurred in Batu Gajah, Perak, and lasted from February to September, an unusually long period. The trees recovered remarkably quickly towards the end of the year, but toddy tappers wisely refuse to tap them until June, 1919.

The following are the results of coconuts Court cases:

State.	No. of cases.	Results.		Fines.		Total.
		Convicted.	Acquitted.	Maximum.	Minimum.	
				$	$	$
Perak	156	131	25	100	2.50	970
Selangor... ...	36	32	4	50	1.00	176
Negri Sembilan...	1	1	...	5	...	5
Pahang	9	3	6	15	2.00	32
Total ...	202	167	35	100	1.00	1,183

Amongst those entered as acquitted from Perak, 23 cases were withdrawn and two were warned and had to pay costs only.

Locust Work.

At the beginning of the year there were no locusts in the Negri Sembilan or Malacca, but in April a swarm from Muar entered Malacca at Tasek, subsequently turning south and dividing, one portion settling at Durian Pipit and one at Ulu Seranbuaya. During May these swarms disappeared, and, as no hoppers or fliers have been seen in these districts since, it may be assumed that they die out without laying eggs.

In April, a swarm of young fliers was seen at Ulu Labis. This swarm moved about and finally died out in November without laying eggs.

In October a swarm was reported from Batu Pahat, and at the end of the year was at Tangkak.

FOOD PRODUCTION ON ESTATES.

By W. S. Cookson.

Results on Dindings Coconut Estate.—This estate is in the coastal district and has the usual clay alluvial soil of such districts. The labour is entirely Tamil. Fresh vegetables have always been grown in gardens allotted to the coolies, planted and upkept by them. Their output has always been enough for the coolies' own needs, and sometimes there has been a surplus for local sale.

In 1916 and again in 1917 attempts were made to grow wet padi, in apparently suitable places. Both attempts were utter failures, the chief reason being that the coolies appeared to have little or no knowledge of wet rice cultivation.

In 1917, at the suggestion of the coolies themselves, a ragi, or millet (*Eleusine coracana*) to which they are accustomed in their own country was tried. Experimental plantings were highly successful, and since that time efforts in the direction of growing food-stuffs have been chiefly confined to this millet.

Italian millet (*Setaria italica*) and maize (*Zea mays*) have been put down, but without success. The former perhaps because of imperfect pollination, and the latter on account of a maggot which ate out the heart of the grain.

There was no difficulty in persuading the Tamils to plant ragi in their spare time. Tamils are keen on money, and the idea of having more money in hand because they could substitute ragi grown by themselves for rice which had to be paid for, appealed to them very strongly. Moreover, they had all been accustomed to consuming a certain amount of ragi in India, and the idea of growing ragi here seemed to appeal to them in much the same way that growing roses or wall flowers does to an Englishman—it brought memories of home.

Nearly all the male coolies asked for, and were given, plots among the young coconuts, crops were uniformly good, and the rice requirement of the estate went down perceptibly.

Neither was there any difficulty, when the grain had ripened, in getting it milled. Stone grinding mills of the Tamil type were purchased at $5 each, and issued free of charge to the coolies, seven mills in all. The grinding is usually done by women, and about a gantang of ragi flour can be ground in an hour. Some coolies grind enough flour on Sunday to last through the week, while others devote a few minutes daily to the work. Milling with these simple grind-stones is no more laborious than using a curry-stone.

Ragi mill.—Two granite stones 12 inches in diameter, lower one four inches thick and the upper four and a half. There is a hole in the upper stone two inches in diameter and a peg fastened in the lower stone $1\frac{1}{4}$ inches in diameter. This is inserted through the hole in the upper stone. The ragi is fed through the hole in the

upper stone and runs down between the peg and the side of the upper stone, and the upper stone is slightly concave on the upper surface to hold the grain as it is being fed.

The ragi flour is sometimes used for making a kind of cake, but it is chiefly used with rice. The rice is boiled in the usual manner until about half-cooked: the ragi flour is then added, and the whole boiled until cooked to the coolies' satisfaction—the total time of cooking being about the same as that for boiling plain rice.

The only important objection to the method of permitting coolies to plant ragi on their account is in the fact that it is not easy to get them to look after their gardens in such a manner as to get the best results. The gardens were not dug over properly before planting, nor were they kept thoroughly clean weeded, and the undesirability of encouraging weed growth need not be emphasized.

During the present year therefore, ragi-growing is being done on a different basis. No cooly is allowed to grow ragi independently, but a gang has been detailed for the work, which is carried out under the supervision of the manager and staff just as any other field work. The land to be put under ragi is dug all over six inches deep, and allowed to sweeten for a few weeks. The seed is raised in nurseries and transplanted, and the land kept clean weeded. Watchmen are detailed in harvest time, to keep off birds and pigs, and harvesting done on estate account. The total cost will be worked out, and ragi issued to the coolies at cost price. Assuming a yield of 200 gantangs per acre, which experience has shown to be conservative, the cost price will not exceed 20 cents per gantang.

Observations.—The object of the above activities is not altogether concerned with the present crisis in rice supply. It is felt that it will be sound economics for any plantation situated in a country where the bulk of the food supply has to be imported, to raise part of its own food supply if it can possibly do so. Ragi at 20 cents per gantang will probably compare favourably in cost with imported rice for many years to come, and during the periods of food shortage, which seem to recur intermittently, a good profit would be shown on the ragi area, and the estate-produced crop might sometimes make the difference between having enough food for the coolies and not having quite enough.

Furthermore, although it cannot be urged that it is sound business to try to force this country to produce all its own food when it is so situated that it could probably never produce its food as cheaply as it could import it from countries that are more favourably placed for food production, yet there is something to be said in favour of such a country producing at least a proportion of its most essential foods, particularly of those kinds which it can most nearly produce in competition with other countries. By as much as its imports of food are cut down by locally grown products, will the balance of trade tend to the favour of this country. This balance would undoubtedly be restored by the importation of articles other than food which would make for the increased prosperity of the country. The difficulty here, of course, is that unless a system of protection were instituted, such as exists in the matter of sugar in Australia and America, the producers of food would be

driven out of business by their losses in competition with the imports from the cheap rice-producing countries. Such a protection is obviously impossible. However, there remains the fact that ragi, at least, as shown above can probably be produced to a considerable extent without loss, and, from information received, the same appears likely to apply to certain grams and pulses which are now being almost entirely imported from India.

If this country were to devote more attention to food production, presumably as it learned the business, means would be found to reduce costs, and it is not out of the picture to imagine that in certain circumstances, such as a rise of wages in the rice-growing countries, or the introduction of improved methods and new agricultural machinery this country might find itself sometime able to produce much of its food just as cheaply as it could import it. For after all the land and growing conditions in this country are good. It is only in their cheaper labour plus the fact that they are already established in the business and understand it, that other countries produce food more cheaply than we.

If an attempt ever is to be made to produce food-stuffs in this country to any appreciable extent, the present period of rice shortage is undeniably a good time to begin. And if a beginning is to be made, ragi might reasonably be one of the crops first to be put down on estates where Indian labour exists, because is an easy crop to grow, its food value is nearly as high as that of rice, and it can be largely substituted for it in times of need; it stores particularly well, and some Indian coolies, at any rate, seem to welcome it as a regular substitute for a portion of their rice ration.

The method of leaving the planting to the coolies themselves has many defects. Planting can be done successfully for a time on the extensive method, where plenty of suitable reserve land is available. But for most estates the only practicable method as a permanent thing would appear to be the setting aside of a certain acreage to be permanently devoted to food-stuffs and its careful cultivation on a sound intensive system.

NOTES ON THE CULTIVATION OF RAGI. (ELEUSINE CORACANA.)

By F. G. Spring and J. N. Milsum.

NOTES on ragi cultivation have already been published in the *Agricultural Bulletin, F.M.S.*, and a preliminary circular has been issued by the Food Production Committee, F.M.S. and S.S. In view of the urgency for planting large areas to meet immediate requirements it is considered advisable to place in the hands of the planters all available information regarding this crop.

The major portion of the information has been obtained from experiments conducted by the Department on the Agricultural Reserve, Petaling Hill, Kuala Lumpur, though the writers have taken the opportunity of visiting a number of ragi-producing estates in different parts of the country.

Endeavours are being made to procure large stocks of ragi for distribution and its arrival will be announced in the local press. There are considerable quantities in hand, which it is hoped will help to meet the situation until further supplies arrive from India.

The cooly requirement of ragi, per month, is estimated at four gantangs, so that with a crop of 250 gantangs twice a year, one acre will support, approximately, 10 coolies.

Eleusine coracana.—Kalvaragu, keppai (Tamil), *ragi* (Hindustani and Canarese), *kurakkan* (Singhalese).

Description.—A stout tufted grass, with erect somewhat compressed culms, three feet high. Leaves arranged in two rows, large and smooth, narrow tapering to a point. Panicles varying from one to sixteen, according to the variety and state of cultivation, each composed of from six to twelve spikes. Each spike is from two to three inches long, usually incurved, composed of two rows of sessile, three to four flowered spikelets. Seeds globular, brown, somewhat wrinkled, covered with a thin aril. A hardy plant that will grow well in Malaya.

Varieties.—The cultivated plant, *Eleusine coracana*, is supposed to have originated from the wild plant, *Eleusine indica*, commonly met with all over the low-country throughout India. A number of minor varieties are recognized; in fact each district appears to have varieties of its own. They may, however, be divided into two main classes—

(1) Closed headed varieties called in Tamil *karunguruthai*,

(2) Open headed varieties, known as *talaivirichan*.

Distinct varieties are also in use for dry and wet lands and for early and late seasons; the only visible difference being in the nature of the panicles and colour of the grain. The Tamil coolies are able to recognize several varieties from the seed already introduced into this country. A sub-species *E. coracana var. stricta* differs from the type in having the spikes straight, and being of a somewhat larger size.

At the present stage in the cultivation of this crop in Malaya, it is unlikely that attention will be paid to any one variety in preference to another. It seems quite possible, however, that certain varieties may appear better suited for cultivation in this country than others. Should the growing of ragi become more general than at present—there are indications that this will be the case—the isolation of robust and heavy cropping strains, will be work of considerable importance. Considerable variation has been noticed amongst the crops grown on Petaling Hill both as regards yields and size of plants.

Economic uses.—Ragi is an important food crop in India and it is estimated that $2\frac{1}{2}$ million acres are under cultivation in the Madras Presidency. The total area for all India devoted to this crop averages from $5\frac{1}{2}$ to $6\frac{1}{4}$ million acres. In many parts it is the staple grain, being perhaps the most productive of Indian cereals. In a favourable season an increase of two hundred fold is obtained, though on rich land the most productive races are said to give an increase of as much as five hundred fold. Ragi is eaten in many districts in India, chiefly by the poorer classes; it keeps well and is frequently stored in pits for several years in the Mysore country. The grain is not liable to become attacked by insects or suffer from moulds and is therefore a very valuable grain for storing in case of famine. The seeds are milled and reduced to flour which is then either eaten baked as cakes or mixed with rice in the proportion of two of the former to one of the latter. The flour may also be made into bread, and though rather sour is relished by the less fastidious of coolies, i.e., coolies that have not been too long in Malaya to have acquired a taste for the sole use of rice as a cereal food. It is unlikely that this cereal will ever form a sole diet for imported Indian labour, but if Tamils would eat it as half of their cereal ration a very great saving would be affected. The proportion of husk to grain is 5 to 6 per cent. by weight. Approximately, 160,000 seeds go to one pound of grain.

So far, the only means of milling the grain in this country, has been by small stone hand-mills. This is a very laborious process and it is not to be wondered at that coolies prefer eating rice, which is so easily prepared for consumption. It is hoped, however, soon to have small power mills for demonstration purposes and as these might be driven from the rubber factory plant, or bullock power there should be little difficulty in milling the flour at a small cost. Such mills installed in districts that could grow ragi should provide a great incentive to its further cultivation and more general adoption as part of the Tamil coolies' food.

Cultivation.

In India two methods are employed in growing ragi according to the type of land and the rainfall. In districts where an even distribution of rainfall is experienced, amounting to about 50 inches, ragi is grown dry, i.e., with no irrigation. When there is less, irrigation is resorted to and very large areas of wet or garden ragi are cultivated. In some districts this crop may follow paddy in rotation or even take the place of paddy when the water stored in the irrigation tanks is insufficient for the successful cultivation of the latter. Dry-land ragi yields a crop of about half that obtained from wet ragi. An average crop may be 1,000 to 1,500 pounds of

grain and 4,000 pounds of straw. The straw is not of great nutrient value but in some districts is in considerable favour as a fodder. Where abundant supplies of water are obtainable and irrigation is practised, wet-land ragi is grown almost throughout the year. The yield varies considerably but 2,000 to 3,000 pounds of grain, per crop, per acre, may be obtained. The fodder is cut and fed green and weighs up to 8,000 pounds per acre.

Cultivation in the Malay Peninsula.—Ragi will grow in most soils, other than laterite. Good surface drainage is essential but land that has suffered from wash is unsuitable. The writers have visited a number of estates in Selangor and in the majority of instances, suitable land for the cultivation of ragi has been noticed. Low-lying but well-drained land, frequently found ajoining ravines is suitable. Drainage is essential and should the land be swampy in any places, a system of open drains feeding the main outlet will often bring the land into a condition suitable for the cultivation of ragi. Young rubber and coconut clearings are frequently quite suitable for growing ragi. The land must be made quite clean of weeds and the surface slightly stirred for receiving the seeds. Sowing may be done by broadcasting by hand, at the rate of about 10 pounds of seed to the acre. Ragi from broadcasted seed ripens three or four weeks earlier than if first sown in nursery beds and afterwards transplanted into the field. This factor should be taken into account to permit of harvesting occurring during dry weather. A small nursery should be made and sown at the same time the broadcasting is done to provide material for filling any vacancies that may require replanting. Harvesting and other operations are the same as recommended for transplanted ragi.

Experiments made at Petaling Hill and elsewhere have, however, shown that the best results are obtained by transplanting ragi, and in view of the great saving of seed and more regular crop obtained, this method is recommended in preference to the broadcasting of seed.

Preparation of the land for ragi cultivation.—The area of land that it is desired to plant will determine what form of cultivation is most economical. Where several acres are devoted to the cultivation of cereals, agricultural implements, as ploughs, harrows and cultivators, should be used.

On small areas the land selected should be cleared of all weeds and roots. It is then dug over to a depth of one changkol. If the land is inclined to be swampy or suffer from wash, it will be necessary to allow for adequate drainage. If the seed is to be sown broadcast it will probably be necessary to go over the land again with the changkol to bring the surface to a fine enough tilth for sowing. If Tamil labour be employed this will cost from $15 to $20 per acre for small areas. Should there be lalang present the cost will be higher as also if there are stumps, logs to be removed, or drainage to be made.

Virgin jungle land when cleared lends itself well to the growing of one or more crops of ragi. In this instance the cost of preparing the land is lower—$10 per acre should be sufficient—as a slight surface changkolling is all that is required. Broadcasting is to be recommended for virgin jungle, as to transplant seedlings, while timber is still on the ground, would be very costly.

On large areas of land where it is possible to use agricultural implements the costs of cultivation are reduced to a minimum, once the land is clean of all roots and lalang. In this connection the actual costs of preparing land for ragi cultivation on Petaling Hill, Selangor, are of interest and are given. The land was full of lalang with occasional low 'blukar' before being taken over. The changkolling contract was let to a Chinese contractor in the first instance.

Costs of opening up and preparing land for ragi cultivation—

Cost of changkolling once (contract), the depth of a changkol	$30.00 per acre
Second changkolling and breaking up the sods (contract)	12.00 „
First ploughing	3.80 „

(Half an acre per day with ploughman and carter, including food for pair bulls for two days)—

Second ploughing	$3.80 per acre
Harrowing and heaping rubbish ... ... (Harrowing three acres per day)	1.00 „
Burning rubbish	.20 „
Total cost per acre ...	$50.80

Cost of preparing land for a second crop—

First ploughing	$3.80 per acre
Second ploughing	3.80 „
Harrowing	.90 „
Total cost per acre ...	$8.50

It should be pointed out here that the bulls are only able to plough $\frac{1}{2}$ acre of land per day at Petaling Hill as the land is undulating and heavy to work. On light flat lands it is quite possible that a pair of bulls would plough $\frac{3}{4}$ acre a day.

It was considered that the land in question required a dressing of lime before a second crop was planted. The lime was placed on the land before ploughing and after slaking was thrown over the land by hand labour and ploughed in. The lime was applied at the rate of 10 pikuls to the acre and the following are the actual costs incurred:

Cost of application of 10 pikuls lime per acre—

Cost of 10 pikuls lime at 85 cents per pikul ...	$ 8.50
Cartage „ (distance three miles) ...	1.00
Throwing over the land (two coolies per acre one day)	.80
Total cost per acre ...	$10.30

Seeds-beds.—Nursery beds of convenient size should be made on well-drained land. Five hundred square feet of land is sufficient for one acre. The soil should be well changkolled and brought to a fine tilth. The seed is sown broadcast and lightly covered with fine earth. The beds require no protection. Watering is unnecessary unless the weather be dry. The seeds germinate in six days and grow rapidly. In three or four weeks the seedlings are nine inches high and ready for transplanting. Five pounds of seed is sufficient to provide enough planting material for one acre. The seed should be sown thinly to ensure the seedlings being hardy and robust, to stand the strain of being transplanted. It is usually unnecessary to have to tell Tamil coolies details regarding these and subsequent operations as they are already familiar with them. The average time that this crop takes to mature is three and a half to four months from transplanting and therefore, the two best seasons for sowing the nurseries are March to May and September to November, resulting in the crops being harvested during the dry weather usually experienced from July to August and January to February.

Transplanting.—This operation, should, when possible, be carried out during dull weather. The young plants are carefully lifted from the nursery and the ends of the leaves cut off to prevent undue evaporation. It is important to see that the seedlings are not pulled up; they should be lifted with a spade or fork and care taken that their roots are not dried up by exposure to the sun. The distance of planting should be about one foot, each way, though on good land the plants may be given more space to allow of full development. The plants are dibbled in, by hand, and firmly surrounded by soil. In a few days they become established and commence throwing out fresh leaves. The flower spikes make their appearance in from six to eight weeks from transplanting. Weeds are likely to appear and should be removed by a surface changkolling of the land. The cost of transplanting varies according to the condition of the land but $10 per acre has been found to be the average charge. This figure is obtained by an allowance of 30 women coolies and one mandor working one day to transplant one acre of land.

Harvesting.—The crop shows signs of maturity within from three to four months from transplanting. The heads ripen unevenly and are cut as they mature. The heads are made into bundles to facilitate transport. Harvesting operations extend for several weeks and it is necessary to cut the mature heads every week until the whole crop has been harvested. It is very difficult to estimate the cost of harvesting per acre but it should work out about the same as harvesting paddy.

A careful watch must be made for birds and it is necessary to remove the heads immediately upon maturity, otherwise a large amount of grain will be lost. The heads should be well dried in the sun and threshed out by beating. Woman labour is suitable for this work. The grain, when harvested, does not appear to be attacked by any insect pests, and is said to keep for eating for several years. Observations, however, tend to show that the germinative power deteriorates upon keeping the seed for more than three months. This may be due to damp weather conditions, possibly if the grain were stored in a very dry place, its germinative power might be

considerably extended. Cattle will eat the stubble with relish and on estates, where cattle are kept, they might be turned on the land after harvesting or else the straw might be cut and fed to the animals.

Threshing.—This operation is done by beating the bundles of heads with sticks. Tamil coolies are adept at this work though it is a laborious process. The husk is separated from the seeds by being trodden underfoot and afterwards winnowed by hand. Machinery would be a great saving of labour and it is to be hoped that suitable types may be found for use in Malaya. An order has been placed, in Australia, for a winnowing machine.

Milling.—After the seed is thoroughly dry it is put through a small stone hand-mill; the flour obtained is carefully seived and the rough material collected and again put through the mill. The flour is of a greyish colour. An order has been placed, in India, for a small power-mill.

Cooking.—The following methods of preparing ragi flour for consumption have kindly been supplied by Mr. Murray Thomson, of Malakoff Estate, Province Wellesley; the Tamil labour force on this estate has grown ragi for some time past:

(1) Put a quantity of water in an earthenware pot and when boiling gently pour in a few handfulls of flour and stir the mixture in much the same way as one would cook porridge. Boil for about 15 minutes, and allow it to stand a little time before eating. This porridge can be eaten either with milk or rice water.

(2) Early in the morning take one chupak of flour, and a little cold water, making a thick paste, put it in an earthenware vessel, cover it and leave it until 3 p.m. allowing to ferment. Place ½ chupak of rice in water on the fire and when boiling add the mixture prepared during the morning and cook for about 15 minutes. It should then be a thick pudding, so allow it to stand in the pot overnight. This pudding will remain good for two or three days and should be eaten cold with a little buttermilk or rice water, using salt to taste. No salt is used in cooking. The colour of this pudding is a reddish-brown, with the white rice showing through it. This is the favourite method of preparing ragi flour; it is eaten twice a day while rice is taken only at night. The pudding may also be eaten without the addition of rice but the coolies say that it is more wholesome with rice.

(3) A kind of bread is also made but it is more of a scone than ordinary wheaten bread. It is made by mixing ragi flour and water, a little sugar and a pinch of salt and then worked into a round flat scone or pan-cake and baked on flat iron above the fire. These scones are said to be very good eating and are taken with coffee.

Yields.—So many factors have to be taken into consideration that it is difficult to estimate an average yield of ragi in this country. Small areas of good soil, where it is possible to ensure that no grain is lost through birds, have given a calculated yield of 300 gantangs per acre and over. As a field crop on Petaling Hill the first crop obtained was 190 gantangs per acre, though it is known that in this instance a large amount of grain was eaten by birds before the crop could be harvested. With good cultivation the writers consider that 200 gantangs, per acre, per crop, is a conservative estimate.

Costs of production.—The following figures are based on costs obtained in connection with the cultivation of ragi on Petaling Hill. The second crop of ragi was not actually grown on the same land as the first but by a system of rotation it is hoped, for a time, to maintain the total area of land in a sufficient state of fertility to produce at least 200 gantangs of grain, per acre, twice a year. Capital charges are not included; these consist of tools, two ploughs, one harrow, one cultivator and a pair of bulls.

1st Crop of Ragi.

Opening up and cultivation charges * ...	$50.80 per acre
Nursery charges (including one gantang seed and labour)	2.00 „
Transplanting	10.00 „
Weeding (three months at $1 per acre per month)	3.00 „
Harvesting (three women @ 30 cents working four days)	3.60 „
Threshing (eight coolies @ 40 cents for one day)	3.20 „
i.e., crop of 200 gantangs @	$72.60 „

Cost of production = 36 cents per gantang.

2nd Crop of Ragi.

Preparing land *	$ 8.50 per acre
Liming	10.30 „
Nursery charges (as above)	2.00 „
Transplanting „	10.00 „
Weeding „	3.00 „
Harvesting „	3.60 „
Threshing „	3.20 „
i.e., crop of 200 gantangs @	$40.60 per acre

Cost of production = 20 cents per gantang.

Average cost of production for 1st year = 28 cents per gantang.

3rd Crop of Ragi (*2nd year*).

Preparing land	$8.50 per acre
Nursery, transplanting, weeding, harvesting and threshing charges (as before)	21.00
i.e., crop of 200 gantangs @ ...	$29.50 per acre

Cost of production = 15 cents per gantang.

* For details *see* page 157.

4TH CROP OF RAGI.

Cost of production = 15 cents per gantang.

Cost of production for 2nd year = 15 cents per gantang.

It is realized that the costs given above are high. On flat land where a team could plough $\frac{3}{4}$ of land a day and harrow four acres in the same time, the cost of production would be about 13 cents per gantang for a crop of 200 gantangs. Should a crop be harvested without loss from the ravages of birds it is quite possible that a yield of 250 gantangs might be obtained per acre per crop, costing to produce about 10 cents per gantang.

NOTE ON PLANTING DRY PADI.

TWO gantangs of dry padi seed are sufficient to plant one acre, as a sole crop, allowing four seeds to the hole with the holes spaced one foot apart. In practice, however, it is difficult to restrict the sowing to four seeds to the hole but in view of the large demand for seed the necessity for economy in planting material is urged.

TUNG OIL OR CHINESE WOOD OIL AND CANDLENUT OIL FROM ALEURITES SPP.

By B. J. Eaton.

DURING recent years the oil derived from the seeds of *Aleurites* spp. has become of considerable importance, chiefly on account of its drying properties, in which it resembles linseed oil, although not as good in certain respects.

Cultivation in Malaya.

Seeds of one species, *Aleurites fordii*, were obtained from the Bureau of Plant Industry, Department of Agriculture, United States of America, in January, 1914, and planted out in the Government Experimental Plantation near the offices of the Agricultural Department. This is the species being grown in the United States of America and stated to be the chief source of Tung oil. (*Vide* Annual Report, Director of Agriculture, F.M.S., 1914.)

The plants, however, although promising well at the start, have since made no progress and the cultivation of the species on the land in question must be considered as unsuccessful. A few specimens of *Aleurites triloba syn. molucanna*, planted by the Department, appear to be thriving in the grounds of His Highness the Sultan of Perak, Kuala Lumpur, adjoining the Experimental Plantation. (*Vide* Annual Report, Director of Agriculture, F.M.S., 1915 and 1916.)

It has recently been suggested by the Director of the Imperial Institute, London, that further trials be carried out with *Aleurites montana*, a species which is probably more suited to tropical or sub-tropical conditions.

Seeds of *Aleurites* sp. have been forwarded recently to the Agricultural Department by Mr. A. M. Tuke, Manager of the Khota Tampan Estate, Upper Perak. These seeds are derived from trees which are being cultivated by Mr. Tuke, who supplies the following information :

"The original seed was obtained from the Philippines in 1915 and was planted at stake, 30 feet apart in a sandy loam soil. The seed germinated in about three months and the trees are now (March, 1919) nearly four years old. The trees have spread rapidly at the bottom, and narrowing at the head, so that the growth closely resembles that of a pine tree. Seed started to form in about three years in the months of September and October and reached maturity in about five to six months. The yield of whole seed, including shell, per tree is, I should imagine, about 75-100 lbs."

Samples of the seed were forwarded to a well-known firm of analysts in Scotland and the results of the analyses, which will be quoted later, show that the oil is very similar to Chinese Tung oil.

The species has been identified by Dr. Foxworthy, Research Officer of the Forest Department, Federated Malay States, as *Aleurites molucanna*, known in the Philippines as "Lumbang." This species is synonymous with *Aleurites triloba*. Mr. Milsum, Superintendent of Government Plantations, Kuala Lumpur, states that the older leaves lose the tri-lobed character of the young leaves.

The results obtained by Mr. Tuke indicate therefore that further trials are necessary with different species, before it is concluded definitely that the plant cannot be grown successfully in this country. At the same time, it has been stated that the oil from this species, known as candlenut oil, is not of the same value as the Tung oil or Chinese wood oil from *Aleurites fordii* or *Aleurites montana*.

Source.

The seeds of *Aleurites* spp. are contained in a nut having a hard somewhat corrugated shell and are obtained chiefly from the species *Aleurites fordii* and *Aleurites montana* growing in China and contiguous countries. One species (*Aleurites cordata*), is said to be indigenous in Japan and to yield Japanese Tung oil, which differs from Chinese Tung oil. [It would appear, however, that some Japanese wood oil may be derived from another plant—*Pawlownia imperialis*—and some confusion exists in the literature (*vide* "Report of the Progress of Applied Chemistry," Vol. II, published by the Society of Chemical Industry, London.)] *Aleurites molucanna* or *triloba* (candlenut tree) is also grown in the Philippines.

The cultivation of the tree is also increasing in the Southern States of America and 40,000 trees are stated to have been under cultivation in 1914. The oil from the American seeds is said to be similar to that from Chinese seeds, the species grown being *Aleurites fordii*.

Uses.

As stated above, Tung oil belongs to the class of vegetable oils known as drying oils, and is thus similar to linseed oil and can be used for similar purposes such as the manufacture of paints and varnishes or the manufacture of linoleum. It is probable that, since the drying properties of the oil are not as good as those of linseed oil, the oil may be used largely as an adulterant of linseed oil.

Fryer and Weston (*Oils' Fats and Waxes*, Vol. I) state that the oil is an important substitute of linseed oil when the latter is high in price and that the exports to Europe show a considerable decrease when the price of linseed oil is low. In 1906 nearly 29,000 tons were exported from Hangkow. These authors state that it is the quickest drying oil known but inferior to linseed on account of its opacity and the inelasticity of the skin produced on drying. Krumbhaar states that the speed of polymerization (indicated by thickening of the oil) constitutes the greatest difference in behaviour of Chinese wood oil and linseed oil. It is stated to be used largely in China as a natural wood varnish and waterproofing material. It would appear that considerable adulteration of the Chinese Tung oil exported to Europe is practised.

Chemical Characteristics.

Fryer and Weston (*Oils' Fats and Waxes*, Vol. 1) distinguish between Tung oil derived from *Aleurites cordata*, which is almost certainly *Aleurites fordii* or *montana*, if derived from China, and candlenut oil derived from *Aleurites molucanna* which they describe as a tree covering large areas in the western tropics.

The following analytical constants quoted by Fryer and Weston for Tung oil and candlenut oil together with the constants obtained from the sample of oil from seeds from Mr. Tuke's estate are given below:

—	Tung oil (*Aleurites cordata*).	Candlenut oil (*Aleurites triloba* or *molucanna*.)	Candlenut oil from Khota Tampan Estate.
Specific gravity @ 15.5° C...	0.941 (Vars. 0.933—0.944)	0.925	0.9257
Solidification of fatty acids	37° C.	13° C.	—
Refractive index @ 40° C. ...	1.475	65.7 (Z. B.)	—
Solubility (Valenta test) ...	46.5°	—	—
Iodine value	165 (Vars 160—170)	164	163.1
Saponification value ...	192 (Vars 190—193)	193	191.4
Acid value	Usually under 12	—	0.86
Unsaponifiable matter (per cent.)	0.4—1.3	0.5—1	0.32

It will be seen that the chief difference between the Tung oil and candlenut oil lies in the higher specific gravity of the former and the higher solidification point of the fatty acids. In other respects the constants of both oils are very similar. The specific gravity of the oil from Khota Tampan estate more closely resembles that given for candlenut oil. It should be borne in mind, however, that the differences may be due to the different origin of the oils rather than to any intrinsic differences between the oils from the two species.

Yields.

According to Fryer and Weston the kernels of the nuts from *Aleurites cordata* yield 53 per cent. of oil.

The samples from Khota Tampan Estate gave the following results:

Kernels	30	per cent.
Shells	70	„
Oil in kernel	60.6	„
„ calculated on the whole nut ...	18.17	„

The oil-content of the kernels is therefore high, although, owing to the large percentage of shell, the oil on the whole nut is comparatively low.

Extraction of Oil.

In China, crude native wooden presses are said to be still in vogue.

The oil is cold pressed at first and the cold pressed oil is exported. The hot pressed oil has a very dark colour. The seeds are said to be roasted over a naked flame and ground between stones before expression. The yield by these crude methods is about 40 per cent. The oil cake residue is said to be poisonous and is used as a fertilizer.

(*N.B.*—The oil has purging qualities, and probably the active constituent remains largely in the residue.)

On a commercial scale the oil could be expressed in any of the modern oil expression machines described in a recent issue of the *Agricultural Bulletin*, Vol. VII, No. 1, January-February, 1919. Suitable nut-cracking machinery, however, would be necessary to remove the hard shell, prior to expression of the kernels.

No refinement is said to be carried out, except settling filtration of the oil by the merchants who collect it from native sources in China. The exported oil ("white Tung oil") from cold expression, is, however, possibly refined in the countries of import. "Black Tung oil" from hot expression is probably used chiefly locally.

Prospects of Cultivation.

Until larger scale experiments are carried out, it is at present not possible to give any satisfactory idea as to yields and profits.

On the figures supplied by Mr. Tuke, assuming only 75 lbs. of nut per tree with trees planted 30 feet apart or say 50 trees per acre and on a basis of 30 per cent. of kernels and an oil expression on a commercial scale of 55 per cent., the yields per acre would be as follows:

Nuts per acre	75×50	$= 3{,}750$ lbs.
Kernels	$\frac{3{,}750 \times 30}{100}$	$= 1{,}125$,,
Oil	$\frac{1{,}125 \times 55}{100}$	$= 618.7$,, $= 5.5$ cwts.

The above figures with linseed oil at say £30 per ton (pre-war price) and Tung oil, at any rate below this price, would not appear to give a very good return on the capital necessary and the upkeep cost.

It is probable, however, that the trees could be planted closer than 30 feet by 30 feet.

The cost of planting and upkeep for three to four years would be very similar to that of the rubber tree.

It can be stated, with practical certainty, that it would be necessary to manufacture the oil in this country and that the export of seed would not be economical.

FURTHER NOTE ON THE SHIPPING OF COCONUT OIL IN BULK.

With reference to the articles "Copra and Coconut Products" by the writer contained in this *Bulletin*, Vol. VI, No. 12, November-December, 1918, page 570, and "Note on the Shipping of Coconut Oil in Bulk." *Ibid*, Vol. VII, No. 2, March-April, 1919, the following particulars taken from the *Scientific American*, Vol. CXX, No. 9 of March 1st, 1919, should be of interest.

"New methods of handling coconut oil at Pacific ports are now in successful operation. Previous to the war, the bulk of this oil was shipped to Europe, but with the closing of European ports great quantities came to the United States. It is estimated that we will receive coconut oil to the value of $60,000,000 during the year 1919.

"Until recently the oil was shipped from the Far East in cases and barrels. The excessive cost and great waste of this led to the attempt to ship in bulk. The problem was a difficult one because of the fact that the oil solidifies at 70 degrees Fahrenheit. Experiments in running heating tubes through the tanks of vessels, storage houses and cars have now reached such a stage of practicability that bulk shipment of coconut oil is recognized as having arrived.

"This enables tankers which have taken cargoes of refined or lubricating oils to Asiatic ports to load to capacity with coconut oil for delivery into bulk storage on our Pacific Coast, and subsequent distribution in tank cars. One of the first companies to enter the field has set up a storage plant in San Francisco, with a complete equipment for getting the oil out of the steamer into storage, and out of storage into the tank cars. Six-inch pipe lines lead from the storage tanks to the piers and to the tracks, and all necessary couplings are made with flexible steel hose.

"When the coconut oil is pumped into the steamer's hold in the Orient it is of the consistency of heavy fuel oil. The scheme is not to maintain it in this state throughout the voyage, but to let it freeze up as solid as it pleases while the vessel is *en route*. It is merely necessary to have the oil at pumping consistency on arrival; so steam is turned into the heating tubes while the ship is a day or two out of San Francisco. In the same way, the oil is allowed to solidify in the storage tanks and again in the tank cars, and steam turned into the heating tubes of these units only when it becomes necessary to reduce the oil to flowing consistency. In this way a great deal of steam is saved; in fact, it is this alone that makes the process a feasible one commercially.

"At the storage plant the oil is never purposely permitted to remain in the six-inch pipe line leading from the docks to the storage tanks. When the tanks on the vessel have been emptied, steam or compressed air is introduced into the outer end of the pipe line behind the oil, and all of the latter remaining in the line is forced into the storage tanks. Nevertheless, there is danger that the oil will become hardened in the pipe line and obstruct the latter

wholly or partly. So a one-inch heating tube is carried down the centre of the six-inch pipe, returning on the outside of that pipe to the boiler room. By turning steam into this circuit any oil that may remain in the six-inch line is soon melted out. The lines that are used in filling the tank cars are similarly equipped with a heating core; here, however, after filling a car the oil is permitted to remain in the filling line, to be melted out when the next car rolls into place.

"The oil pumps on board the vessel and at the storage plant must be equipped with a steam jacket, or else provision must be made for the certain draining of all oil from the pump immediately after operation ceases. Oil allowed to remain in a pump that has no steam jacket would soon solidify and then a pressure of 100 pounds of steam would not suffice to clear the tubes."

It will be seen from the details given that the method adopted is identical with the recommendations made by the writer for dealing with the transport problem of shipping the oil in bulk.

B. J. E.

RUBBER MACHINERY.

By Henry C. Pearson.

Published by "The India Rubber World," New York, 1915, pp. 413 and index, 428 illustrations.

THIS book by the well-known author of various interesting books on different aspects of the raw and manufactured rubber industry, who is also the editor of *The India Rubber World*, the leading American scientific and technical journal of the rubber industry, has been received recently from the publishers.

The book, as stated, is an encyclopædia of the large number and varied types of machines used in the preparation and extraction of raw rubber of different kinds and the manufacture of rubber goods, including drying machinery and plant, mixing machines, machinery for the preparation of ingredients, fabric preparing machines, calenders, vulcanizers of all kinds, spreaders and tubing machines, presses and moulds, machines for the preparation of reclaimed rubber and cements, temperature regulating devices, and laboratory machines and apparatus used in the chemical examination of rubber together with testing machines and other devices. The book is divided into twenty chapters dealing with the different mechanical operations employed in the rubber industry, commencing with the preliminary washing of crude rubber in the manufactory. It will be seen that some of the washing machines used in the manufactory are similar to those used for crêpeing in the rubber factory on estates. If any criticism might be offered, it would be to suggest that in a future edition, the book might commence with a brief description of estate machinery used in the preparation of the plantation product in the form of sheet and crêpe for first grades and crêpe for lower grades. Similarly the second chapter might include a reference to and illustration of any good type of smoke house used in the drying of raw plantation rubber. Estate factory operations are the preliminary operations employed in the preparation of a clean dry rubber ready for the manufacturer's uses. It is not possible in a short review to deal adequately with all the machines described for the numerous operations of a rubber manufactory in which many different types and qualities of rubber goods are being manufactured. The chapter on rubber laboratory equipment, including testing apparatus for experimental vulcanizing laboratories, is well prepared and illustrated. A valuable section describing numerous temperature recording and regulating devices is included.

The value of the book to the non-technical reader interested in the rubber industry lies especially in the excellent illustrations including both photographs of machinery and diagrams to illustrate special mechanical devices.

The book should prove extremely valuable to rubber machinery engineers, both in the manufactory of rubber goods and in the raw rubber factory on estates. Managers of estates will also find much information which should be of interest, enabling them also to realize the many operations to which the raw material may be subjected after it leaves the estate.

The book should be in the hands of all rubber chemists, especially those in rubber manufactories or those who have to advise estates in regard to suitable factory machinery.

B. J. E.

RESUME OF MINUTES OF A MEETING OF THE ADVISORY COMMITTEE, DEPARTMENT OF AGRICULTURE,

HELD AT THE OFFICES OF THE DEPARTMENT, ON THURSDAY, 1ST MAY, 1919, AT 11 A.M.

PRESENT:—Mr. L. Lewton-Brain (Director of Agriculture) Chairman, Messrs. H. Armstrong, J. Bruce, J. S. Ferguson, Jas. French, J. D. McCulloch, Chew Kam Chuan and B. Bunting (Assistant Agriculturist) Honorary Secretary.

ABSENT:—The Hon'ble Mr. R. C. M. Kindersley, Messrs. C. Bell, W. de Leighton Brooke, W. S. Cookson, J. W. Kennedy, R. W. Munro, R. H. Phillips, C. Ritchie and Lee Kong Lam.

Messrs. B. J. Eaton and A. G. G. Ellis attended the meeting.

1.—MINUTES.

The minutes of the previous meeting held on 30th January, 1919, having been circulated are taken as read and confirmed.

2.—QUARTERLY PROGRESS REPORTS.

The quarterly progress reports of officers of the Department are laid on the table and the Chairman invites discussion.

The CHAIRMAN reports that the Government is still prepared to consider any definite scheme for the erection of coconut oil mills locally, which may be put forward by those interested in coconuts and if necessary give financial assistance on the matter.

After some discussion it is agreed to leave the matter over until the next meeting.

The CHAIRMAN informs the meeting that the two blocks of land, situated at Sungei Buloh and Sungei Besi, recommended by Mr. Spring as being suitable for the Selangor large scale experimental farm, have been formally reserved by the Resident until a detailed survey is made and the area finally selected.

Arrangements have been made with Mr. Hay to make a rough survey of the areas in question and when this is completed it will be necessary to select one of the areas and ask that a detailed survey be made and the area definitely reserved for the purpose of a large scale experimental farm.

The large area of land available on the Johol-Gemas road in Negri Sembilan is now being surveyed by the Topographical Survey Branch in connection with an irrigation scheme for the cultivation of padi and when this is completed a suitable area would be selected and reserved for an experimental farm.

The CHAIRMAN reports that the areas provisionally selected at Gunong Angsi and Ginting Simpah for an experimental cinchona plantation have been temporarily reserved pending a definite selection.

The area reserved at Gunong Angsi is about 1,500 acres, but it is not expected that more than 500 acres will be required for the purpose. A letter is read from the Secretary to Resident Negri Sembilan, regarding the construction of a road from Bukit Putus to Gunong Angsi which if carried out will be of great use in connection with the proposed cinchona plantation.

The CHAIRMAN states that the amount of quinine salts required by the Malaya Peninsula is much too small to justify the running of a factory and it has been suggested that it might be possible to have the bark treated and the quinine salts extracted by one of the factories controlled by the Indian Government.

A letter has been addressed to the Indian Government inquiring whether such an arrangement is feasible.

The CHAIRMAN points out that both *Cinchona succirubra* and *Cinchona ledgeriana* have been successfully grown on an experimental scale at the Government Plantation, Gunong Angsi, at an elevation of 1,500 feet, but until analyses have been made of the percentage of alkaloid in the bark it is impossible to draw any definite conclusions as to their cultivation on a commercial scale.

Mr. FRENCH states that *Cinchona succirubra* would probably give better results than *Cinchona ledgeriana* at the present elevation, but a bigger percentage of quinine would be produced at a higher elevation and considers that the best results will be obtained at an elevation of about 5,000 feet. *Cinchona succirubra* grows quicker and produces more bark than *Cinchona ledgeriana*, but, owing to the lower quinine content of the bark, it is much less profitable. In India the average quinine content of the bark of *Cinchona succirubra* was only $1\frac{1}{4}$ to $1\frac{1}{2}$ units, whilst *Cinchona ledgeriana* produced as much as 3 to 4 units.

The CHAIRMAN informs the Committee that arrangements are now being made to send representative samples of the bark of the two varieties of cinchona grown at Gunong Angsi to be extracted at the Government quinine factory in India and hoped that the results of the tests would indicate the possibilities of cinchona cultivation in this country.

Mr. FERGUSON asks whether any further action has been taken in connection with the proposed stock-breeding farm.

The CHAIRMAN replies that the matter has been referred to the Secretary of State and until the scheme is sanctioned by the Home authorities no further action can be taken in the matter.

The CHAIRMAN refers to the necessity of increasing the production of food-stuffs on estates and points out the advisability of reserving surplus stocks of ragi and hill padi for seed purposes.

Mr. BRUCE asks whether on certain types of soil the cultivation of hill-padi would probably be unsuccessful.

The CHAIRMAN replies that laterite and other poor soils are unsuitable for its cultivation and, although the best yields are produced on newly opened jungle land, excellent results are obtained on either heavy loams or light clay soils, which have been under previous cultivation.

Mr. BRUCE asks whether soya bean has ever been tried in this country.

The CHAIRMAN replies that numerous experiments have been carried out by the Department in connection with the cultivation of this crop but they have all proved that it cannot be successfully grown in this country.

Mr. FRENCH refers to Mr. Munro's report on the experimental coconut plantation and suggests that some figures of general working costs might be given in the reports.

The CHAIRMAN replies that these figures are given in the Superintendent's quarterly report, which, unfortunately, had been received too late for circulation.

Mr. FRENCH refers to the flooding of certain areas of the estate and asks whether it is not possible to bund the boundaries and keep the water out.

The CHAIRMAN replies that he had approached the Irrigation Engineer to report on a scheme of drainage and the work will be undertaken when conditions permit.

The CHAIRMAN reads a letter from the Superintendent regarding a suggestion from Mr. Munro to adopt a six-monthly weeding system on the areas planted up with sweet potatoes pointing out the danger of the areas becoming infested with lalang if such a system is adopted.

Mr. FRENCH suggests that it would be advisable to weed the areas every two months rather than every six months and after some discussion the Committee decide that this would be the safer course to adopt.

The CHAIRMAN raises the question of providing a hostel for Sapintas Estate and submits a rough plan of a building costing about $15,000.

It is agreed to ask that a special vote of $20,000 be granted for the purpose of providing a hostel and, when the vote is approved, the Government Architect be asked to submit plans to this Committee for approval.

The following sub-committees are appointed:

Pests and Diseases.—Messrs. H. Armstrong, J. Bruce, J. S. Ferguson and J. W. Kennedy.

General Experiments.—The Hon'ble Mr. R. C. M. Kindersley, Messrs. C. Bell and W. de Leighton Brooke.

Experimental Coconut Plantation.—Messrs. W. S. Cookson, R. W. Munro and R. H. Phillips.

Castleton Estate.—Messrs. R. W. Munro and R. H. Phillips.

Pondok Tanjong Estate.—Messrs. W. S. Cookson and J. W. Kennedy.

Kuala Tembeling Estate.—It is agreed not to appoint a sub-committee for this estate during the ensuing year.

The CHAIRMAN reads a memorandum, which he has submitted to Government in connection with the establishment of Research Studentships in the Department of Agriculture, and points out that under such a scheme graduates of one or other of the Universities in Great Britain would be granted a scholarship to work at the Department of Agriculture, Kuala Lumpur, for one or two years on definite lines of research. It is expected that a number of such students would ultimately be selected to fill permanent appointments on the staff of the Department when vacancies occurred.

It is recommended that such scholarships should be granted in the first instance for one year and be renewed for a second year on the recommendation of the Director of Agriculture.

It is agreed that a copy of the memorandum be circulated to all members of the Advisory Committee when they would have a better opportunity of discussing it.

The CHAIRMAN states that legislation has now been made for the prevention of the use of alum as a coagulant on the lines recommended by the Committee.

The CHAIRMAN refers to a letter received from Mr. Eric Macfadyen, which has been published in the local press, suggesting the advisability of giving short courses of lectures and demonstrations to planters on tropical agriculture at the offices of the Department.

Although the principle of the scheme is a very sound one it is almost impossible for the Department, with its present shortage of staff, to make such an arrangement without seriously interfering with the present schemes of work. Moreover, so far about 20 names only have been received from planters willing to attend such a course if it is arranged.

After some discussion it is decided that the whole matter be deferred for a further six months.

The meeting terminates at 12.45 p.m.

INDIAN IMMIGRATION COMMITTEE.

A MEETING of the Indian Immigration Committee was held at Kuala Lumpur on 14th May.

There were present: The Controller of Labour (Mr. J. B. O Aldworth), Chairman, Principal Medical Officer, F.M.S. (Dr. C. L. Sansom, C.M.G.), Messrs. F. G. Harvey, R. E. Smith, C. W. Bradburne and J. W. Kennedy, with the Secretary, Deputy Controller of Labour, Penang (Mr. E. W. F. Gilman).

Mr. Kennedy was welcomed by the Chairman on appointment to the Committee.

The following statements of arrivals and departures of Southern Indians for the period 1st January to 30th April, 1919, and for the corresponding periods in the eight preceding years, were laid on the table:

Arrivals.

Year.	State-aided.		Ordinary.		
	Adults.	Minors.	Adults.	Minors.	
1911	19,010	1,526	4,513	273	
1912	15,120	1,103	6,619	398	
1913	15,707	1,233	6,391	455	
1914	11,875	988	5,682	340	up to 6-8-14
1915	4,364	291	2,178	141	
1916	12,162	1,076	5,389	522	
1917	15,171	1,455	6,121	452	
1918	19,008	1,882	3,754	278	
1919	13,369	858	4,434	602	

Departures.

Year.	Adults.	Minors.
1911	17,594	623
1912	22,139	787
1913	27,827	1,347
1914	27,659	1,336
1915	21,429	996
1916	20,996	804
1917	22,751	889
1918	22,495	906
1919	19,468	811

A return was presented showing that the number of kangany licences registered in Penang during the first four months of the year was 4,088 as compared with 3,060 during the corresponding period of 1918.

During the first four months of this year registration of 23 licences was refused at Penang, while 90 were cancelled in consequence of reports received from the Emigration Agents in India as compared with 26 and 76, respectively, during the corresponding months of 1918.

On the consideration of the allotment of additional licences, a statement was presented showing that up to the end of April 5,019 licences had been taken up by estates. The preliminary allotment for 1919 was 6,872, in addition to these the Deputy Controller of Labour, Penang, has allotted 184 on further consideration. It was decided that additional licences to the extent of 50 per cent. of the preliminary allotment may be registered during the next three months with a minimum allotment of two for each estate.

The CHAIRMAN reported that the Chief Secretary to Government had addressed the Government of Madras regarding the establishment of an emigration agency and depôt at Coconada, no reply has yet been received.

The CHAIRMAN stated that the land for the proposed new depôt at Avadi had been purchased at the price approved by the Committee at the last meeting, viz., Rs. 4,500 and work was proceeding. A fifty-days' contract had been let from 10th April but work was not started till a week later—it should therefore be ready for occupation early in June.

With regard to shipping arrangements the Chairman stated that there were now four steamers carrying immigrants and while the meeting was in progress a telegram was received stating that a fifth, the *Bharata*, had been placed on the line.

A statement of quarantine expenses was submitted and considered showing that the average cost per head at each station for the first quarter of 1918 was as follows:

Penang $2.39, Port Swettenham $2.08, general average $2.12 as compared with $2.17 in the corresponding quarter of 1918.

Audited accounts for the half year ending March 31st were laid on the table and passed after consideration. The arrears of assessment, which had been reduced from $105,317 at the close of the preceding half year to $41,976, were considered and certain items amounting to $4,466 were written off as irrecoverable.

It was decided, subject to the consent of His Excellency the High Commissioner, to prescribe for the third and fourth quarters of 1919 a quarterly rate of $2 to be paid by every employer in respect of every Indian labourer employed or working on the place of employment during the respective quarters. Similar rates were prescribed for the Straits Settlements, Johore, Kedah and Perlis, and Kelantan. The number of working days prescribed in a quarter for the purpose of calculating this assessment was again fixed at 78 for the next two quarters. It was decided to pay a recruiting allowance of $5 on account of all labourers recruited by licensed kanganies introduced during the third and fourth quarters of 1919.

The subject of sleeping accommodation at Penang and Port Swettenham for coolies awaiting steamers to India was considered. Sites have already been obtained and it was decided to proceed as soon as possible with the erection of buildings to accommodate 300 persons.

With regard to the payment of assessment on account of overtime worked by labourers on the production of foods it was decided to make a rule exempting from liability to assessment all overtime work performed on the cultivation of food-stuffs in pursuance of an order of the Director of Food Production.

In connection with certain proposals made by Mr. Harvey the Chairman states that the Government has accepted in principle the suggested amendment of the law by which employers will be enabled to compel their labourers to work overtime at food production and that circulars to this effect in several languages are now being printed.

The date of the next meeting was fixed provisionally for the beginning of August.

MINUTES OF GENERAL MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA,

held at Sungei Ujong Club, Seremban, on 25th June, 1919, at 10.30 a.m.

PRESENT:

Mr. F. G. Harvey (*Chairman*)
„ J. W. Kennedy (*Vice-Chairman*)

and the following DELEGATES:

From Bahau-Kuala Pilah D.P.A....		Messrs.	A. L. Simmons and Fred. Knocker
„	Batu Tiga D.P.A.	„	G. H. Bennett and Carlyle Bell
„	Central Perak P.A. ...	„	N. B. Beach, P. Guy Lawford, and G. Gordon-Brown (by their proxy, G. Wiseman)
„	Johore P.A.	„	J. S. Beldam and W. B. Campbell
„	Kajang D.P.A.	„	O. P. Dakeyne, R. F. Mesney, H. L. Lamotte and L. A. Tucker
„	Kapar D.P.A.	„	Noel Fisher and H. Case
„	Klang D.P.A.	„	R. Napier Hendrie and C. A. Buxton
„	Kuala Lumpur D.P.A. ...	„	H. Armstrong and F. Clyde Jeavons
„	Kuala Selangor „ ...	„	H. B. Dudley and N. Fish
„	Lower Perak P.A. ...	„	R. G. Bayley and H. C. Tobutt
„	Negri Sembilan P.A. ...	„	J. Bruce, J. D. McCulloch, V. A. Tayler, G. B. W. Gray, R. Gooch, F. G. Souter, A. Burgess, W. Buyers, A. Waterfield and G. W. Hingston
„	Ulu Selangor D.P.A. ...	„	G. C. Bailey and L. W. Tivy

HONORARY MEMBER.—L. Lewton-Brain, Esq. (Director of Agriculture, F.M.S.).

VISITORS.—Messrs. H. C. Butler, G. W. Walker, C. Ward-Jackson, C. C. F. Crowther, W. Thomson, A. J. Harrison, L. J. Godwin, G. W. R. Millar, R. C. Sherar, T. A. Kennard, R. D. Fenton, I. Burgess, R. Manners, F. J. Fane, H. W. F. King, E. E. Smith, E. S. Biddlecombe, J. Johnstone, R. M. Levinge, D. B. S. Teale, T. A. Crosbie, F. Cunningham, F. J. Heherr, R. S. Armstrong, G. E. Teale, J. F. Walker, J. A. Clery, T. E. R. Parsons, A. G. Robins, H. McKellar, C. H. Ryves, A. M. Kennedy, H. T. Piper, R. M. A. Maycock, W. R. Macandrew, D. R. Garrett, R. M. S. Keir, S. G. F. Wright, C. B. Purser, R. J. Morrison and C. J. Hewson.

SECRETARY.—Mr. H. C. E. Zacharias.

1.—MINUTES.

Mr. HARVEY draws attention to the new rule passed at the last meeting.

On the proposal of Mr. BRUCE, seconded by Mr. BENNETT, the minutes are confirmed and certified as correct, subject to the elimination of the three last paragraphs on page 29 which had been inserted through a typographical error.

2.—AFFILIATION.

The SECRETARY reports having received letters from the newly formed Bahau-Kuala Pilah District Planters' Association, and from the Kedah Planters' Association, both of which asked for affiliation. The planted acreage of the former body amounted to 16,878 acres and of the latter 32,034 acres.

Mr. HARVEY extends a hearty welcome to these two Associations and formally moves their affiliation with the Planters' Association of Malaya.

Mr. KENNEDY would heartily second the proposal, which is carried *nem. con.*

3.—WAR RELIEF.

The SECRETARY submits the following letter which he had written; also the following statements of accounts:

"KUALA LUMPUR,
"*2nd May, 1919.*

"DEAR SIR,

"I thank you for your favour of the 27th of March.

"As regards War Relief Fund, I had the pleasure of seeing Mr. Arthur Young who informed me of the views held by the London Committee. The Annual Meeting of this Association was held on the 30th ultimo, when the further policy in respect of the War Relief Fund was discussed and the unanimous decision come to was that the Fund should now be closed.

"Should at some future time it be found that the money collected was insufficient for special cases arising it was felt that no difficulty would be experienced in re-opening the Fund.

"No doubt it is too early as yet to consider what should be done with any unexpended balance which may remain in your hands, and nothing definite on this point was proposed at our meeting, but I think the general opinion held by planters is that, if there is any such balance, a proportion should be handed over to the Planters' Benevolent Fund of Malaya (incorporated by Enactment in this country). I say a proportion advisedly, as of course we realize that the whole amount collected for the War Relief Fund has not been put up by planters. When the time comes your Committee will no doubt consider this point and inform us of their views.

"Believe me, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"SIR WILLIAM TAYLOR, K.C.M.G.,
"MALAY STATES INFORMATION AGENCY,
"88, CANNON STREET, LONDON, E.C. 4.'

THE FEDERATED MALAY STATES WAR RELIEF FUND AND SCHEME No. 2. STATEMENT OF ACCOUNTS, 1st JANUARY TO 31st MARCH, 1919.

Receipts	Amount. £ s. d.
Balance from last account...	34,556 6 8
Remittances from the Planters' Association of Malaya	1,000 0 0
Contributions and Donations received through the Rubber Growers' Association	1,163 14 0
The Sengat Rubber Estate, Ltd.	50 0 0
Interest on Investments...	58 6 0
	36,828 6 8

Payments.	£ s. d.	Amount. £ s. d.
Grants and gratuities:		
Mr. ——	28 0 0	
Dr. ——	3 3 0	
Mr. ——	10 0 0	
,, ——	6 10 0	
Mrs. ——	9 0 0	
Mr. ——	15 0 0	
,, ——	150 0 0	
Mrs. ——	15 0 0	
,, ——	30 0 0	
,, ——	30 0 0	
,, ——	30 0 0	
,, ——	40 0 0	
,, ——	30 0 0	
Mr. ——	25 0 0	
,, ——	25 0 0	
		446 13 0
Bank charges		8 5
Balance in hand		36,381 5 3
		36,828 6 8

The balance of £36,381 5s. 3d. is disposed of as follows:

	£ s. d.	£ s. d.
Five per cent. War Loan (£12,000) at cost		11,400 0 0
Six per cent. Exchequer Bonds		2,000 0 0
Five per cent. National War Bonds, 1927 and 1928 ...		20,000 0 0
Deposits in Chartered Bank		2,000 0 0
Balance of current account in Chartered Bank	1,112 8 6	
Less outstanding cheques	131 0 0	
		981 8 6
		36,381 8 6
Due to Treasurer ...		3 3
		36,381 5 3

(Sd.) W. T. Taylor,
25th April, 1919.

I hereby certify that I have audited the above statement of receipts and payments with the books and vouchers of the Fund and find the same to be correct. The grants have all been duly authorized by the Committee.

(Sd.) A. H. Cullen,
Chartered Accountant,
Honorary Auditor.

73, Basinghall Street, E.C.,
30th April, 1919.

PLANTERS' WAR RELIEF FUND OF MALAYA.

Subscriptions received to 24th June, 1919.

	$ c.	$ c.
Batang Padang D.P.A.		
...	60.00	
		60.00
Batu Tiga D.P.A.		
Begg, N. C.	25.00	
Bennett, G. H. ...	25.00	
Chalmers, A. P. ...	15.00	
Gilman, M. A. P. ...	20.00	
McNeill, F.	20.00	
Orr, H. Douglas ...	30.00	
Robertson, J. A. ...	10.00	
Webb, C. M. ...	5.00	
Williamson, J. ...	10.00	
		160.00
Central Pahang P.A.		
Sungei Bilut Estate	10.00	
		10.00
Central Perak P.A. ...	194.00	
Caldwell, W. J. ...	40.00	
Jonklaas, W. O. ...	20.00	
Robins, N.	5.00	
Wilson, T. K. ...	30.00	
		289.00
Kajang D.P.A. ...	120.00	
Clerk, G. P.	20.00	
Cummins, E. N. T. ...	25.00	
Dakeyne, O. P. ...	50.00	
Ferrers, C. R. ...	40.00	
Kindersley, R. C. M.	50.00	
Mesney, R. F. ...	30.00	
Moullin, H. R. ...	50.00	
Paul, C. K.	40.00	
Schwabe, E. M. ...	40.00	
		465.00
Johore P.A.		
Adamson, H. ...	20.00	
Bolton, G. V. ...	90.00	
Lanadron Estate ...	50.00	
Nordanal Estate ...	50.00	
Ross, D. A.	80.00	
		290.00
Carried forward		1,274.00

	$ c.	$ c.
Brought forward		1,274.00
Kapar D.P.A.		
Pratt, J. C.	18.00	
Stonehewer, R. S. ...	17.00	
		35.00
Kelantan P.A.		
Anderson, W. G. ...	50.00	
Archer, L. D. ...	30.00	
		80.00
Klang D.P.A. ...	17.86	
Biddlecombe, H. T. A.	24.00	
Greenhill, R. D. ...	50.00	
Gulland, D. L. ...	10.00	
Hendrie, R. Napier ...	20.00	
Latimer, T. M. ...	20.00	
Maguire, C.	20.00	
Roberts, C. L. ...	20.00	
		181.86
Kuala Langat D.P.A.		
Irvine, H. C. d'Arcy ...	30.00	
Lendrum, J. B. ...	30.00	
Mann, J. P.	20.00	
Munro, R. W. ...	40.00	
Symons, G. O. W. ...	40.00	
		160.00
Kuala Lumpur D.P.A.		
Armstrong, H. ...	30.00	
Barnet, G. P. ...	50.00	
Campbell, F. M. ...	50.00	
Coppens, P.	20.00	
Douglas, J. B. ...	16.65	
Fox, A. J.	40.00	
Fraser, W. D. ...	40.00	
Harvey, T. R. ...	20.00	
Ladell, R. G. ...	20.00	
McCrow, D. W. ...	20.00	
Smith, M. Sharpe- ...	51.42	
		358.07
Carried forward		2,088.93

	$ c.	$ c.
Brought forward		2,088.93
KUALA SELANGOR D.P.A.		
Gordon, W. M. ...	34.00	
Irving, L. A. ...	30.00	
E. D. M. K. K. ...	40.00	
		104.00
LOWER PERAK P.A.		
Bayley, H.	30.00	
Dell, W.	20.00	
Hargreaves, J. ...	20.00	
McLeod, R. A. ...	40.00	
Pickering, J. T. ...	5.00	
Ratanui Estate ...	59.77	
Symes, A. B. ...	30.00	
Tobutt, K.	10.00	
Wilson, R. J. ...	5.00	
		219.77
M. P. A. A.		
Baber, E.	30.00	
Bukit Mertajam Estate	272.00	
Carless, H. G. ...	24.00	
Josselyn, E. W. ...	40.00	
Rubber Estates of Krian	79.00	
		445.00
Carried forward		2,857.70

	$ c.	$ c.
Brought forward		2,857.70
NEGRI SEMBILAN P.A.		
Adair, H.	30.00	
Burgess, I.	20.00	
Clarkson, S. W. ...	10.00	
Fenton, R. D. ...	40.00	
Grant, G.	20.00	
Handover, W. P. ...	20.00	
Hay, J. B.	17.00	
Hearn, A. J. ...	20.00	
Kellitt, W.	60.00	
King, H. W. F. ...	30.00	
Maycock, R. M. A. ...	20.00	
Paterson, A. F. ...	30.00	
Ritchie, C.	30.00	
Reynolds, K. P. ...	40.00	
Sepang Valley Estate	500.00	
Smith, E. E. ...	40.00	
Tayler, V. A. ...	50.00	
		977.00
TAIPING D.P.A. ...	130.00	
Moraes, H. F. ...	20.00	
Perera, C.	10.00	
		160.00
ULU SELANGOR D.P.A.		
Brunton, R.	20.00	
Coe, P. F.	20.00	
Kennedy, W. C. ...	20.50	
		60.50
Grand Total		4,055.20

Mr. HARVEY says that it had been decided at the last meeting to close this Fund, but money apparently was still coming in, and he considers that they had best go on accepting further subscriptions if members were generously inclined to continue their contributions.

Agreed to.

4.—PASSAGE CONTROL.

The SECRETARY submits the following correspondence:

"KUALA LUMPUR,
"*2nd May, 1919.*

"DEAR SIR,

"Enclosed I beg to hand you copy of a cable which was despatched by us to you on the 30th ultimo, as the result of a unanimous decision arrived at by the Annual General Meeting of this Association held on that date.

"The various Chambers of Commerce in this country and the Federated Malay States Chamber of Mines are taking similar action, and I think I am right in saying that few matters have aroused so intense a resentment as this 'Marama' scandal.

"Trusting that you will be able to assist us in fixing the responsibility and thanking you in anticipation for your kind help,

"Believe me, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"SECRETARY,
"RUBBER GROWERS' ASSOCIATION,
"38, EASTCHEAP, LONDON, E.C. 3."

Cable despatched to Secretary, Rubber Growers' Association, 38, Eastcheap, London, E.C. 3, on 30th April, 1919.

"URGENT.

"SERVITUDE, LONDON,

"Pam request you kindly constitute immediately Committee of Enquiry on arrival if possible of s.s. 'Marama' into alleged hardship on board due to overcrowding, insufficient staff, insanitary arrangements, etc., with a view of fixing responsibility should such allegations prove well founded; suggest also you approach Board of Trade, Colonial Office, Admiralty and Straits Association.

"ZACHARIAS."

"KUALA LUMPUR,
"*30th April, 1919.*

"*Letter addressed to*

"Chamber of Commerce, Singapore.

"Chamber of Commerce, Penang.

"F. M. S. Chamber of Commerce, Kuala Lumpur.

"F. M. S. Chamber of Mines, Ipoh.

"DEAR SIR,

"Enclosed please find copy of cable we have addressed to-day to the Rubber Growers' Association.

"The Annual General Meeting of this Association which passed a resolution to this effect instructed me also to approach you with a view of your taking similar action in this matter.

"Believe me, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*"

"SINGAPORE CHAMBER OF COMMERCE AND EXCHANGE,
"SINGAPORE,
DEAR SIR, "*10th May, 1919.*

"We thank you for your letter of 30th ultimo, enclosing a copy of a cable addressed by you to the Rubber Growers' Association, London.

"Our Committee have also received cables from the Chambers of Commerce at Kuala Lumpur and Penang on this matter and, after consideration and in view of the Captain's report, they have decided that while they sympathize with the action already taken in the matter, they are not in favour of the joint cable to London suggested by the F. M. S. Chamber of Commerce.

"Yours faithfully,
"(Sd.) GATTEY AND BATEMAN,
"THE SECRETARY, "*Secretaries.*
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

Letter addressed to
"The Hon'ble the Chief Secretary, F.M.S., and
"The Hon'ble the Colonial Secretary, S.S.
"KUALA LUMPUR,
"SIR, "*3rd May, 1919.*

"I have the honour to inform you that the present method of controlling passages came up for discussion at the Annual Meeting of this Association held on the 30th ultimo, when a resolution was unanimously passed which I was subsequently instructed to forward to you, viz., 'This Association submits that a Board of Control be formed immediately consisting mainly of medical practitioners to classify passages so as to ensure priority being based upon consideration of health.'

"A copy of this resolution has also been forwarded by me to the . . .

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*"

"COLONIAL SECRETARY'S OFFICE,
"SINGAPORE,
"No. 4397/1919. "*9th May, 1919.*
"SIR,

"I am directed to acknowledge receipt of your letter of the 3rd instant on the subject of passage control and to reply that the suggestion made by your Association will be considered and a further reply sent to you in due course.

"I have, etc.,
"(Sd.) G. L. HAM,
"*for Colonial Secretary, Straits Settlements.*
"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,

"*16th May, 1919.*

"No. 2877/1919.

"SIR,

"I am directed to acknowledge receipt of your letter dated the 3rd May, 1919, on the subject of the resolution regarding the method of controlling passages passed at the Annual Meeting of your Association held on the 30th April, 1919.

"I have, etc.,

"(Sd.) W. MACKRAY,

"*Acting Under Secretary, F.M.S.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"RUBBER GROWERS' ASSOCIATION,

"38, EASTCHEAP, LONDON, E. C.,

"*8th May, 1919.*

"S.S. 'MARAMA.'

"DEAR SIR,

"I duly received your cable on the 2nd May, reading as follows:

> "'Pam request you kindly constitute immediately Committee Enquiry to enquire on arrival if possible of s.s. "Marama" into alleged hardship on Board due to overcrowding, insufficient staff, insanitary arrangements, etc., with view fixing responsibility should such allegations prove well founded suggest also you approach Board of Trade, Colonial Office, Admiralty and Straits Association. Zacharias.'

"The cable arrived in time to be discussed at a meeting of the Council held on Monday. I have ascertained that the 'Marama' is due on, or about, the 10th instant. Enquiries are being made and our Emergency Committee has the matter in hand.

"Yours, etc.,

"(Sd.) FRANK G. SMITH,

"*Secretary.*

"SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"FEDERATED MALAY STATES CHAMBER OF MINES,
"IPOH,
"*10th June, 1919.*

"S.S. 'MARAMA.'

"DEAR SIR,

"Your letter of the 30th of April, and the copy of your cablegram to London were duly discussed by my Council on the 2nd instant when I was instructed to say that this Chamber associates itself with the idea that an enquiry should be held.

"Yours, etc.,
"(Sd.) A. J. C. TOWERS,
"*Secretary.*

"SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"SOCIETY OF ESTATE MEDICAL OFFICERS,
"MALACCA,
"*23rd June, 1919.*

"DEAR SIR,

"For your information I append copies of the question and answer on the subject of s.s. 'Marama' made in the House of Commons, 20th May, 1919. The question was put as the result of telegraphic action on the part of the above Society through the kind agency of Sir William Watson Cheyne.

"I am, etc.,
"(Sd.) M. J. RATTRAY.

"SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR.

"79. Sir Watson Cheyne.—To ask the Parliamentary Secretary to the Shipping Controller if he is aware of the hardships to the passengers on board the s.s. 'Marama' due to overcrowding and defective sanitation: and if he will look into the matter.

"Colonel Wilson.—My Right Honourable Friend is not aware that any hardships were experienced by the passengers on board the s.s. 'Marama.'

"This vessel was specially diverted to Singapore to remove the large number of civilians for whom conveyance to the United Kingdom was urgently required for medical reasons.

"The whole of the accommodation and the sanitary arrangements were inspected by experienced Board of Trade Surveyors on arrival of the ship in this country and before the passengers left. It is clear from the report of these Surveyors that there was no overcrowding, that the sanitary arrangements were quite satisfactory and that there was no reasonable cause for complaint.

"(Copy subscribed, 'With Colonel Wilson's compliments.')"

"Excerpt from letter from Sir William Watson Cheyne:

"'I asked a question in the House to-day on the subject of your telegram and also spoke to the Shipping Controller.

"'He denied any discomfort or bad sanitation and said the ship had been thoroughly inspected and reported upon before starting.'"

(Letter dated 20th May, 1919.)

"Colonial Secretary's Office,
"Singapore,
"*14th June, 1919.*

"No. 4397/1919.

"Sir,

"With reference to your letter of 3rd May forwarding copy of a resolution passed by your Association on the subject of the passage control I am directed to inform you that it is considered that the present system is working satisfactorily.

"2. The principle by which the Control Board is guided is that a berth or berths already booked may, if necessary for urgent cases, be commandeered, but that otherwise there should be as little interference as possible.

"I have, etc.,
"(Sd.) E. C. H. Wolff,
"*for Colonial Secretary, Straits Settlements.*

"The Secretary,
"Planters' Association of Malaya,
"Kuala Lumpur."

Mr. Harvey says that Dr. Croucher had been appointed additional Controller of Passages and he believes that things now were working smoothly. As regards the "Marama" incident they had heard the correspondence read out and he enquires whether any member wished to speak on the subject.

There being no reply.

5.—DEMOBILIZATION.

Mr. Harvey draws attention to the following correspondence, the reply having been sent under his instructions; and he hoped now that this meeting would confirm his action. Everybody was trying his best to do this patriotic duty, but at the same time there was no point in getting over from India men who could not be employed here.

"No. 6676,

"GOVERNMENT OF INDIA,

"CENTRAL EMPLOYMENT AND LABOUR BOARD,

"SIMLA,

"*14th May, 1919.*

"FROM

"THE SECRETARY,

"EMPLOYMENT AND LABOUR BOARD.

"SIR,

"The object of this Board is to assist in the re-settlement in Civil life of officers and other ranks on release from Army Service and in the case of those who have got no definite employment to go back to, and who wish to find employment in India, to endeavour to put them in touch with suitable employment. All such officers and other ranks have therefore been requested to submit to this Board a record of their qualifications and desired employment on forms known as Personal Record Forms in the case of officers, and Non-Military Employment Forms, in the case of other ranks. A specimen copy of these forms is enclosed to show you the kind of information that is obtained about applicants.

"In order to find out suitable avenues of employment, Provincial Organizations of this Board have been formed in all the big industrial centres in India and Ceylon and they (*inter-alia*) advise the Board of vacancies while the Board endeavours to send them the record forms of suitable applicants, and if the employers notifying the vacancies consider the record form shows that an applicant is *primâ facie* suitable for their vacancy, an interview is then arranged. Later, if they are satisfied with the applicant, this Board arrange for the release of the applicant from Army Service, pending general demobilization (subject of course to the exigencies of the service).

"2. In this connection, the United Planters' Association in Southern India has kindly offered to work as a Provincial Organization of this Board, and as many of our applicants have expressed a desire to find employment as planters in Malaya, the Secretary of the United Planters' Association in Southern India was asked if he knew of a similar organization in Malaya, and the name of your Association has been furnished by them.

"3. The matter was discussed at a meeting of the Re-settlement Committee of the Board on the 15th April, 1919, and I am to enclose an extract of the minutes on the subject, and to enquire whether your Association will be prepared to co-operate with this Board with a view to putting applicants to the Board, who have expressed willingness to take up appointments as planters in Malaya, in touch with suitable vacancies in Malaya.

"4. In India there is a scheme of Probationary Release under which an applicant is allowed to work for an employer for three months, and if either is dissatisfied at the end of that period, the applicant can revert to Army Service. If both are satisfied permanent release can be arranged, provided the employer is

prepared to guarantee at least two years' employment to the applicant and to guarantee his repatriation (*a*) if he is certified medically unfit, (*b*) if he proves unsatisfactory, and (*c*) at the end of his agreement. The object of this is to ensure that no applicant is stranded in the East: and is necessary because as soon as his permanent release from Army Service is sanctioned he loses his right to repatriation by the Army Authorities. These two different kinds of releases are carried out under Forms R. E. 17 and 18 and R. E. 6, respectively, and specimens of these forms are enclosed for your information.

"5. If your Association agreed to co-operate with this Board it is thought that as any employment arranged would be ex India, the three months' probationary scheme would not be suitable and that permanent release should be applied for on Form R. E. 6, but I am to say that if your Association think employers would not be prepared to give the guarantee of repatriation, the Board might, on your recommendation, modify the same by recommending release on the usual agreement entered into by planters in Malaya for Assistants brought out by them from England.

"6. As regards getting over the difficulty of a personal interview of an applicant by a possible future employer, which of course would not be practicable in your case, I am to ask whether it would be possible for the employer to nominate some one in India to interview any applicants who by their record forms appear to be *primâ facie* suitable. It is understood that your Association has a representative in India for the purpose of recruiting labour who might be a suitable person to act in the capacity. I am also to mention that the Secretary of our Madras Provincial Organization (Mr. Bathurst) is a member of the Malay Civil Service and doubtless there are others in India who know all about Malaya. I am to say that facilities exist whereby an applicant can travel at Government expense to any place in India to be interviewed with a view to employment.

"7. I am also to point out that by employing those at present engaged in Army Service, employers would save the usual expense of a passage from England as is pointed out in the minutes enclosed. Of course in the case of Indian Army Reserve of Officers as the majority were recruited in India they have no rights to repatriation and employers would have to pay their passage from India to Malaya.

"8. The documents noted in the enclosed statement are sent to show the general working of the Board, and other information can be supplied if required.

"I have, etc.,

"(Sd.) S. WEBB-JOHNSON, CAPTAIN,

"*Officiating Secretary,*

"*Central Employment and Labour Board.*

"To

"H. C. E. ZACHARIAS, ESQ.,

"SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"KUALA LUMPUR,
"*6th June, 1919.*

"SIR,

"I have the honour to acknowledge receipt of your letter 6676 of the 14th ultimo and in reply am instructed to say that the supply of European employees on rubber estates in Malaya is about to exceed the demand. Moreover, the bulk of appointments both as regards Managers and Assistants is made in England and men coming to this country therefore have little chance of obtaining more than a merely temporary post.

"My Committee therefore while in full sympathy with the objects of your Board regret that they can give no hope of opportunities offering in Malaya.

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"SECRETARY,
"CENTRAL EMPLOYMENT AND LABOUR BOARD,
"SIMLA, INDIA."

Mr. TAYLER entirely agrees with the reply sent and moves that it be resolved that the action of the Chairman be endorsed by this Association.

Mr. SOUTER seconds the proposal, which is carried unanimously.

6.—TAMIL IMMIGRATION.

The SECRETARY submits the following correspondence:

"KUALA LUMPUR,
"*31st May, 1919.*

"No. 201/1919.

"SIR,

"With reference to your letter of the 8th January, 1919, on the subject of the constitution and status of the Indian Immigration Committee, requesting that the Chief Secretary would receive a deputation on the subject, I am directed to inform you that the suggestions of the Standing Committee of the Planters' Association of Malaya have received the consideration of the Government.

"2. I enclose a copy of the notes taken by the Chief Secretary of the interview granted by him on 21st January, 1919, to the deputation from the Standing Committee.

"3. The Government was under the impression that the present system controlling Indian Immigration to this country was working very well, and is very doubtful if the changes proposed would be beneficial.

"4. The Chief Secretary has been in communication with the Government of the Straits Settlements on the subject and has been informed that the Colonial Government is not in favour of the changes advocated by the Standing Committee.

"5. If it is desired by your Association to pursue the matter further the Chief Secretary recommends that the existing Indian Immigration Committee might be asked to give the question their consideration.

"I have, etc.,

"(Sd.) W. MACKRAY,

"*Acting Under Secretary to Government, F.M.S.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

DEPUTATION OF THE COMMITTEE OF THE PLANTERS' ASSOCIATION OF MALAYA TO INTERVIEW THE CHIEF SECRETARY ON THE SUBJECT OF THE INDIAN IMMIGRATION COMMITTEE.

21st January, 1919.

Present: Sir E. L. Brockman.
The Hon'ble Mr. R. C. M. Kindersley,
Chairman, Planters' Association of Malaya.
Mr. F. G. Harvey, Petaling.
,, L. Mooijaart.
,, C. Ritchie.

"The desire of the deputation was to alter the constitution of the Indian Immigration Committee and extend its activities with a view to instituting a more energetic recruiting campaign. Recruiting not being the province of the Labour Department, it was desired that the Committee should be dissociated from the Labour Department. The proposals would involve extra expense but this would not fall upon the Government but would be covered by extra assessment.

"It was suggested as follows:

"The head-quarters of the Committee should be in Kuala Lumpur and its staff there.

"The Committee should be constituted somewhat as follows:

"Chairman—A Government official.

"Principal Medical Officer or Senior Health Officer.

"Director of Public Works or his representative.

"General Manager, Railways.

"A Straits Government officer.

"Five planting members nominated by the Planters' Association of Malaya.

"One planting member nominated by the Malacca Planters' Association.

"One planting member nominated by Kedah.

"One unofficial member for Penang and Province Wellesley.

"This would make a Committee of fourteen.

"There should be a paid Secretary who should be a Government Officer, seconded for service with the Board.

"Kangany licences should be issued in Kuala Lumpur by the Secretary.

"Meetings of the Committee should be more frequent, say once a month.

"Members of the Committee should be paid.

"There should be one European Inspector under the Committee for the purpose of inspecting ships. He should be constantly travelling in various immigration ships and should not be a Government officer.

"The Agents in India should be under the Committee's direction.

"In India there should be two European Travelling Inspectors, not Government officers but under the control of the Committee. They would travel about and visit the recruiting areas.

"The reasons given for the proposals were that there was a great shortage of labour and it was imperative that some endeavour should be made to stimulate immigration to this country. It was no business of the Labour Department to do this but it was thought that if the staff in India were under the Committee they would be able to actively promote emigration from India to this country. It would, I imagine, be still necessary to have Government Agents in India.

"I warned the deputation that the proposals would have to be laid before the Government of Madras and they might object to some of them.

"(Sd.) E. L. Brockman."

"Kuala Lumpur,
"*5th May, 1919.*

"*Letter addressed to*

"Dr. J. C. Colin Ford, Supdt., Emigration Depôt, Negapatam.

"Dr. G. Brooke, Chief Port Health Officer, Singapore.

"H. C. Bathurst, Esq., Emigration Agent, S.S. & F.M.S., Madras.

"E. W. F. Gilman, Esq., Deputy Controller of Labour, Penang.

"Dear Sir,

"Papers in connection with Tamil immigration were placed before the Annual Meeting of this Association held on the 30th ultimo as per copy attached, and I am instructed to convey to you the thanks of the Association for your constructive criticism.

"The Standing Committee of this Association is now drafting recommendations arising out of the papers submitted.

"Believe me, etc.,
"(Sd.) H. C. E. Zacharias,
"*Secretary.*"

"PENANG,
"*7th May, 1919.*

"No. 5 in D.C.L. Pg. (Misc.) 94/19.

"SIR,

"I have the honour to acknowledge with thanks the receipt of your letter of the 5th May forwarding a copy of papers in connection with Tamil immigration, and I note that your Standing Committee is now drafting recommendations arising out of these papers.

"I have, etc.,
"(Sd.) E. W. F. GILMAN,
"*Deputy Controller of Labour, Penang.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*20th June, 1919.*

"SIR,

"I have the honour to hand you a copy of certain papers on Tamil immigration which were placed on the table at our Annual Meeting on the 30th of April. I am now instructed by the Standing Committee to ask for a favourable consideration by your Committee of the following points:

"1. That regular journeys to and from India be made by the officers mentioned on p. 37.

"2. That the Madras Emigration Agent be provided with a motor car. (*Vide* p. 42.)

"3. That a Telugu speaking officer be sent to Cocanada as soon as possible. (*Vide* p. 43.)

"4. That the staff in India be given the status of Government officials.

"5. To take steps in regard to the shipping accommodation (*vide* pp. 12, 13, 43 and 44), especially as regards the carrying of cattle on cooly boats and the questions of air space and boat accommodation.

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"CHAIRMAN,
"INDIAN IMMIGRATION COMMITTEE,
"KUALA LUMPUR."

"KUALA LUMPUR,

"*21st June, 1919.*

"No. 375/19.

"SIR,

"I have the honour to acknowledge receipt of your letter dated the 20th June current, forwarding a copy of certain papers on Tamil immigration, which were placed on the table at the Annual Meeting of the Planters' Association of Malaya on the 30th of April, and asking for the favourable consideration by the Indian Immigration Committee of five points which are specified in the letter.

"2. Your letter shall be placed on the agenda of the next meeting of the Committee for consideration.

"3. I should be much obliged if you would inform me in the meantime exactly what staff in India is referred to in point number 4. I fear I do not at present understand what steps can be taken to give to an individual in India who is not a Government official the status of a Government official.

"I have, etc.,

"(Sd.) J. R. O. ALDWORTH,

"*Chairman, Indian Immigration Committee.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

Mr. HARVEY says that he had cleared up the misunderstanding *re* the status of Emigration Officers, having seen Mr. Aldworth on the point.

The present Indian Immigration Board consisted of a majority of planters and they had recently discussed the various points mentioned and they could safely be depended on to do their very best to extend the recruiting ground. From the figures available it appeared that nearly 14,000 coolies had come over in June already. Five ships were now on the run and it was obvious that the position was getting very satisfactory. He personally thinks that matters could now safely be left in the hands of the Indian Immigration Committee who he might add were as a result of their agitation holding frequent meetings. From the letter from the Under Secretary they would see that they had to give a reply on two points, viz., whether in their opinion it would be advisable to get the Indian Immigration Committee reconstituted and to bring all expenditure under the control of such re-constituted body. He now wished an expression of opinion as to whether this matter should be pursued further or else whether the meeting was in favour of leaving matters for the time being in the hands of the Committee.

There are no expressions of opinion on the subject, and the Secretary is instructed to reply to the Under Secretary that for the time being the Association did not wish to proceed further in the matter.

Mr. HARVEY says he had received some very interesting figures from the Controller of Labour, regarding the numbers of voluntary emigrants, their number up to 19th June, 1919, being 5,081 adults and 216 minors as compared with 7,036 adults and 483 minors for the whole of 1918. This surely proved that Malaya was extremely popular with prospective emigrants from Southern India and he believes they would this year have nearly 10,000 voluntary emigrants.

Mr. TAYLER would like to ask whether the Indian Immigration Committee could not publish more regularly figures and statistics such as it was the custom to publish in Ceylon. He would move that the Indian Immigration Committee be asked to publish quarterly, if the figures are available, a complete statement of the Indian labour position in Malaya showing the number of arrivals and departures, losses by deaths, and balance remaining.

Mr. HARVEY remarks that the members of the Indian Immigration Committee were already being supplied with figures of that nature and there was no reason why they should not be published regularly.

Mr. TAYLER's proposal is declared carried.

The SECRETARY says that in this connection he wished to inform the meeting that he had had a private letter recently from Mr. C. F. Andrews in which he said that he was very eager to come and very nearly came by a steamer sailing on the 12th, but for private reasons he was afraid he could not come over for the time being. The letter continued "Will you express to the Planters' Association of Malaya my appreciation of the offer they had made to me in good faith to help them and let it be even that I still hope to come."

The SECRETARY also reads the following letter from the Controller of Labour:

"KUALA LUMPUR,

"*19th June, 1919.*

"No. 365/19.

"SIR,

"I have the honour to inform you that a new temporary depôt has been opened recently about two miles from Avadi on the Poonamallee Road. It is proposed to call it the Melpakkam Depôt.

"The first batch of Telugu emigrants for shipment through the Melpakkam Depôt was admitted on the 6th June.

"The recruiting of Tamils for shipment at Madras was to be resumed on the 9th June.

"I have, etc.,

"(Sd.) J. R. O. ALDWORTH,

"*Controller of Labour, F.M.S.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"PENANG,
"*19th May, 1919.*

"SIR,

"I have the honour to inform you that it has been decided that a further allotment of kangany licences be made to estates, amounting to 50 per cent. of the number originally allotted for 1919 with a minimum of two licences.

"2. Will you please inform the members of your Association?

"I have, etc.,
"(Sd.) H. STEVEN,
"*for Dy. Controller of Labour, Penang,*
"*Secretary, Indian Immigration Committee.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*31st May, 1919.*

"No. 263/19.

"SIR,

"I have the honour to inform you that cases have been brought to my notice of minors being arrested on warrants for the offence of absconding.

"2. It appears that it is not known to all employers that a minor cannot commit the offence of absconding; consequently some employers, when applying for warrants for the arrest of absconders, include minors' names in their informations. This error causes considerable inconvenience to the minors, and has made it necessary in cases for Magistrates to award compensation.

"3. I would ask you to be good enough to call the attention of members of your Association to this matter, as inconvenience and annoyance can in future be avoided by a clearer realization of the legal position on the part of employers.

"I have, etc.,
"(Sd.) J. R. O. ALDWORTH,
"*Controller of Labour, F.M.S.*

"THE CHAIRMAN,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*29th May, 1919.*

"No. 182/19.

"SIR,

"I have the honour to forward as a reminder a copy of paragraph 19 of the minutes of the Indian Immigration Committee meeting held on the 14th May current.

"I have, etc.,
"(Sd.) J. R. O. ALDWORTH,
"*Controller of Labour, F.M.S.*

"MR. F. G. HARVEY,
"PETALING ESTATE,
"PETALING.

INDIAN IMMIGRATION COMMITTEE MEETING HELD ON 14TH MAY, 1919.

Para. 19.

The question of the particulars contained in returns under section 66, Labour Code, with regard to which correspondence had been circulated is considered.

Mr. HARVEY suggests that now that the fee has been raised to $1 per cooly an amended form might be introduced with more explanation as to details required. He proposes to ask the Planters' Association of Malaya to put up recommendations to be brought forward at the next meeting of the Committee.

7.—ESTATE HOSPITALS.

Circulated to the Medical Research Committee, for information:

13th May, 1919.

Copy of letter received from the Under Secretary of State, Colonial Office, Downing Street, addressed to the Secretary, Rubber Growers' Association, dated 12th May, 1919.

"With reference to the letter from this Department of the 24th January last, concerning the medical treatment of Indian immigrants employed on rubber estates in the Malay Peninsula, I am directed by Viscount Milner to inform you that he has now received from the High Commissioner for the Malay States a copy of the Federal Council paper No. 7 of 1918, together with a draft Bill, and a memorandum thereon by the Planters' Association of Malaya.

"2. I am to enclose a copy of the despatch from the High Commissioner transmitting these documents, in view of which Lord Milner would suggest that it would be better again to postpone the discussion of the matter, if a discussion is still desired, until the proposals have taken a more concrete form."

"GOVERNMENT HOUSE,
"SINGAPORE,
"*14th February, 1919.*

"Copy. A. B. J.

"MALAY STATES

"No. 40.

"With reference to your Lordship's telegram of the 23rd January, I have the honour to forward six copies of Federal Council paper No. 7 of 1918 relating to the alteration of system of estate hospitals.

"2. The Madras Government has suggested that this Government should take over control of all estate hospitals, but I am not in favour of the suggestion and both the Chief Secretary and myself are of opinion

(*a*) that estates should be permitted to put up their own hospitals, and that these should not be interfered with so long as they come up to the standard prescribed and are properly conducted;

(*b*) that if planters in any district prefer that Government should provide hospital accommodation, or if they do not provide such accommodation, the Government will do it and levy a hospital rate;

(*c*) that if any existing hospital is not being properly conducted or is insufficient, the Government will take it over or erect one in its place after giving due notice.

"3. A Bill has been prepared and a memorandum on the Bill has been received from the Secretary of the Planters' Association of Malaya. The memorandum has been sent to the Controller of Labour for his observations. Both the memorandum and the Controller of Labour's views will receive consideration and the Bill may not be introduced in its present form.

"4. I annex one copy each of the Bill and the memorandum but further copies will be sent by earliest opportunity."

(Applause.)

Mr. HARVEY says this was most encouraging as it just showed that their representations received favourable consideration when properly dealt with.

8.—LABOURERS' STATEMENTS ON OATH.

Mr. HARVEY says that at the last meeting a resolution had been passed which had been forwarded to the Controller of Labour, the correspondence being as follows:

"KUALA LUMPUR,
"*5th May, 1919.*

"SIR,

"I have the honour to inform you that at the Annual Meeting of this Association held on the 30th ultimo, the following resolution was passed, viz.: 'That the statement made by labourers for certificates issued to them by the Labour Department in lieu of Discharge Notes, be taken on oath.'

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"CONTROLLER OF LABOUR, F.M.S.,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*10th June, 1919.*

"No. 272/1919.

"SIR,

"In reply to your letter dated 5th May, 1919, receipt of which was acknowledged on the 6th May, I have the honour to inform you that I regret I am unable to direct that effect be given to the resolution adopted at the meeting of the Planters' Association of Malaya held on the 30th April last, viz.:

"'That the statement made by labourers for certificates issued to them by the Labour Department in lieu of Discharge Notes, be taken on oath.'

"2. No reasons why it is desirable that such statements should be taken on oath are advanced in your letter, nor can I find any reference to the subject in the report of the meeting published in the *Malay Mail*.

"What object can be gained by compelling a labourer to make statements on oath prior to the issue of the certificate to him I cannot see. These certificates do not relieve the subsequent employer of the responsibility of making enquiries of his late employer. If the object of the proposed oath is to deter the labourer by fear of punishment from giving false information the oath seems to be unnecessary in view of sub-section 66 (iv) of the Labour Code which provides a sufficient penalty for 'any labourer furnishing false particulars to an employer for the purposes of a statement required by sub-section (i).'

"I have, etc.,
"(Sd.) J. R. O. ALDWORTH,
"*Controller of Labour, F.M.S.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

Mr. DAKEYNE on behalf of the Kajang District Planters' Association does not wish to carry the matter any further.

Mr. BENNETT queries whether it made any difference to a Tamil cooly whether he was on oath or not?

Mr. HARVEY believes the best plan would be to ask the Labour Department to do away with the certificates altogether. The present procedure was simply a farce which made easy the conscience of some planters but of no practical utility.

Mr. DUDLEY observes that according to the Deputy Controller of Labour in Klang these chits had been started at the express wish of planters.

Mr. BRUCE corroborates the last speaker's version but thinks that the fact that the coolies were in the habit of telling lies was sufficient reason for asking the Government to enable their statement to be taken on oath.

Mr. TAYLER points out that these chits made it possible for people who wanted to start a Tamil force to do so in the only way possible, viz., by local recruiting.

Mr. CAMPBELL moves that the matter be allowed to drop.

Mr. TAYLER seconds the proposal, which is carried.

9.—PENANG QUARANTINE.

The SECRETARY submits the following correspondence and says that apparently the Malay Peninsula Agricultural Association and the Planters' Association of Malaya had been asked to appoint five visitors each. In the circumstances the Standing Committee had appointed the Chairman and directed him to ask the four Constituent Associations in Perak to nominate one visitor each.

Approved.

"PENANG,
"*17th May, 1919.*

"No. 15 in D.C.L., Pg. (Misc.) 1-1919.

"SIR,

"With reference to your letter of the 4th December, 1918, to the Hon'ble Colonial Secretary, Straits Settlements, concerning the appointment of visitors to the Penang Quarantine Station, and in view of instructions that the President, Vice-President and three delegates of your Association should be among the gentlemen placed on the roster for this purpose, I should be glad if you would place me in the position to submit these five names for the approval of Government.

"I have, etc.,
"(Sd.) G. A. MOUBRAY,
"*for Deputy Controller of Labour, Penang.*

"SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*19th May, 1919.*

"SIR,

"I have the honour to acknowledge receipt of your letter 15/1 of the 17th instant *re* Penang Quarantine Station.

"Our Chairman is Mr. F. G. Harvey of Petaling and our Vice-Chairman Mr. J. W. Kennedy of Gula. As regards the other three delegates, I will place their selection before my Standing Committee at their next meeting.

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"E. W. F. GILMAN, Esq.,
"DEPUTY CONTROLLER OF LABOUR,
"PENANG."

10.—LABOUR CLAUSE IN LAND GRANTS.

The SECRETARY submits the following correspondence:

"KUALA LUMPUR,
"*29th May, 1919.*

"LETTER TO ALL CONSTITUENT ASSOCIATIONS.

"DEAR SIR,

"At the last General Meeting of this Association a proposal was made that Government be asked to insert a labour clause in all new titles for areas of 1,000 acres and over or to adopt such measures as may be deemed preferable to ensure that for every three acres of such new land opened up one cooly will be recruited by the proprietors from outside Malaya.

"Consideration of this proposal was deferred, and I was instructed in the meantime to obtain the opinion of all Constituent Associations on this subject with a view of some decision on the point being made at the next General Meeting of this Association to be held on the 25th proximo.

"I should therefore be much obliged if you would kindly obtain the opinion of your members on the subject and let me know in time for the next meeting their views in the matter.

Thanking you in anticipation,

"Believe me, etc.,

"(Sd.) H. C. E. ZACHARIAS,

"*Secretary.*"

"TAIPING,

"*3rd June, 1919.*

"DEAR SIR,

"My Association is strongly in favour of the proposal that the Government should insist that before new land is given out safeguards should be imposed to make imported labour for opening up this land a *sine qua non* of the terms of the lease.

"Yours faithfully,

"(Sd.) W. H. TATE,

"*Hon. Secretary, Taiping D.P.A.*

"SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"KAJANG,

"*20th June, 1919.*

"DEAR SIR,

"In reply to your letter of 29th May, the opinion of this Association is that one cooly per six acres is sufficient, that titles for 100 acres or over should be substituted for 1,000, and that the clause should state that the coolies are to be recruited within a certain time after the actual planting up of the area.

"With regard to Mr. Harvey's letter of 31st May *re* register of Tamil names, I wish to inform you that a register for this district is being compiled.

"Yours, etc.,

"(Sd.) C. R. FERRERS,

"*Hon. Secretary, Kajang D.P.A.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"KAPAR DISTRICT PLANTERS' ASSOCIATION,
"VALLAMBROSA, KAPAR,
"DEAR SIR, "*21st June, 1919.*

"At an Ordinary General Meeting of the above Association held to-day, the following resolution was passed:

"'That this Association, while welcoming any suggestion to reduce crimping and increase the labour force of the country, does not consider the insertion of a labour clause in new land grants to be practicable or in some cases equitable.'

"Yours, etc.,
"(Sd.) M. H. COCKE,
"*Hon. Secretary, Kapar D.P.A.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"JOHORE PLANTERS' ASSOCIATION,
"DEAR SIR, "*22nd June, 1919.*

"In further reply to your letter of 29th ultimo I beg to inform you that this Association is strongly in favour of the proposal that Government be asked to insert a labour clause in all new titles of areas of 1,000 acres and over or to adopt such methods as may be deemed preferable to ensure that for every three acres of such new land opened up one cooly will be recruited by the proprietors from outside Malaya.

"It is thought, however, that the benefits to be derived from such a proposal, if given effect to, would be greater if made applicable to areas of 500 acres upwards and provision made that recruiting be sustained in subsequent years so that there shall always be a proper proportion of recruited labour.

"Yours, etc.,
"(Sd.) CHAS. PRENTICE,
"*Hon. Secretary.*

"SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LANGAT DISTRICT PLANTERS' ASSOCIATION,
"BANTING,
"DEAR SIR, "*16th June, 1919.*

"Replying to your letter of the 29th ultimo, I have been instructed to inform you that the Committee of this Association is in agreement with the principle of the proposal to be put at the next meeting of the Planters' Association of Malaya as stated in your letter.

"Yours, etc.,
"(Sd.) W. A. STANTON,
"*Hon. Secretary.*

"SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"SEAPORT ESTATE,
"*17th June, 1919.*

"DEAR SIR,

"I am in receipt of your letter of the 29th ultimo, stating that at the last General Meeting of the Planters' Association of Malaya, a proposal was made that the Government be asked to insert a labour clause in all new titles for areas of 1,000 acres and over, or to adopt such measures as may be deemed preferable to ensure that for every three acres of such new land opened up one cooly per acre will be recruited by the proprietors from outside Malaya.

"This letter was placed before my Association at their meeting last evening, and I was instructed to inform you that the meeting was of opinion that the proposal was quite unworkable and inequitable in its present form.

"Yours, etc.,
"(Sd.) C. N. CRUSH,
"*Honorary Secretary.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

Mr. TOBUTT intimates that his Association considered that all Limited Liability Companies should have this clause inserted in all their titles whilst in respect of individual and private companies there should be a limit of 1,000 acres.

Mr. BENNETT believes that the proposal was altogether unworkable.

Mr. KENNEDY in view of the Rubber Lands Bill published in the *Gazette* of 20th June does not see any use in going on with this matter.

Mr. TAYLER says that the Rubber Lands Restriction Enactment had been promised to be merely a war measure and he took it therefore would shortly have to be rescinded.

Mr. JEAVONS says the Kuala Lumpur District Planters' Association approved in principle but not in the present form of the resolution submitted. He would propose a Committee of two members from Perak, two from Selangor and two from Negri Sembilan to be appointed to consider the details of its application.

Mr. DUDLEY says that the Kuala Selangor District Planters' Association had considered this scheme and was quite in sympathy with the idea but found its present form unworkable.

Mr. HARVEY agrees with Mr. Tayler regarding his remarks about the Rubber Lands Restriction Enactment but as the present Bill had been gazetted it looked as if the original Enactment was going to be rescinded very soon.

Mr. MCCULLOCH does not see why his proposal was not practicable. Only a few had said that this was impracticable in working. Regarding what Mr. Bennett said he thought it was decided that

they should recruit as they opened out the land, only for the planted area. As to the number of coolies they proposed should be recruited, there was some difference of opinion. Some Associations suggested a different acreage and others to increase the number to six acres per cooly. Therefore, he thinks they could make it one cooly to every three acres as a good medium between the two. In Negri Sembilan it was known that there was a large number of applications and roads were being opened in those parts. If grants were issued for these a large number of coolies would be necessary. They had been accused in Negri Sembilan of recruiting their Tamil coolies from Selangor. (Laughter.) That may be so or not! But there was no doubt that a large number of new coolies would be wanted. It was no great hardship on an estate to be asked to bring in one cooly for every three acres that they opened up. Once the estate was opened it had done its duty by the country and by the industry. He did not think this would affect to a great extent places of 500 acres in regard to the number of coolies recruited. The thing was they ought to have a safeguard against the big blocks. In one district in Negri Sembilan there was said to be an area of 25,000 acres to be given out and a good road would be put through it, so that they saw they should safeguard themselves. They did not want of course any drastic proposals that would prove irksome. (Applause.)

Mr. BRUCE thinks that their purpose would be best served by raising the area to 3,000 and he would therefore propose that "Government be asked to insert a labour clause in all new titles for areas over 3,000 acres or to adopt such measures as may be deemed preferable to ensure that for every three acres of such new land opened up one cooly will be recruited during the second year of opening and one cooly for every ten acres thereafter during the tenure of the land. Such labour to be either Tamil, Chinese, Javanese or any other nationality, provided the coolies are imported from their native country."

Mr. BUTLER says that in any case they could not do anything until the recruiting position became more normal.

Mr. FISHER wishes to know what the penalty would be for non-compliance with the rule. Would the land be taken away? He also considers it impossible to make such a rule without making provision for the employment of surplus labour.

Mr. JEAVONS thinks there were so many questions arising out of a clause like this and they should consider it very carefully before going to Government.

Mr. WISEMAN says that the Central Perak Association wished the limit to be 500 acres.

Mr. BENNETT agrees with Mr. Jeavons that the question was too important to be passed at a meeting such as the present.

Mr. HARVEY urges consideration of the interests of British capital which was seeking an outlet in this country. He would propose that the Standing Committee hold a special meeting to consider the question and put forward a concrete proposal for the next General Meeting of this Association.

Messrs. McCulloch and Bruce having agreed to this proposal, it is put to the meeting and carried unanimously.

11.—TAMIL NAMES OF ESTATES.

The SECRETARY submits the following circular letter:

"KUALA LUMPUR,

"*31st May, 1919.*

"LETTER ADDRESSED TO ALL CONSTITUENT ASSOCIATIONS.

"DEAR SIR,

"I have been requested by the Indian Immigration Committee to endeavour to form a register of the Tamil names of estates in Malaya.

"With this end in view, the Standing Committee have discussed the matter and it has been decided that each District Planters' Association should prepare a list of its estates employing Indian labour, giving the usually recognized Tamil name of such estates as possess suitable ones and apportioning names to those estates which possess unsuitable names, or no names at all.

"By unsuitable names are meant duplicate names for the same district and names denoting the mile-post of the estate and such names as 'Puthu Totam' and 'Tungal Totam'.

"I add a list of names for estates which are more or less suitable. Indian towns make good names for estates, such as Avadi, Veloor, Tanjore, Salem, Negapatam, Arni, Sittoor, Tirupathi, Arkonam, Mannargudi, Kumbakonam, Namakal, Manavadi, &c. Or Tamil proper names as follows:

Adaikan	Mathurai	Godavari
Alagiri	Mondi	Idumban
Anjalai	Panjalai	Kamali
Biligiri	Pusari	Karian
Danakodi	Rasammal	Kaveri
Etti	Sannasi	Letchumi
Ganappan	Takkan	Mari
Guruvan	Toppai	Nachi
Janagi	Aladian	Pakkiri
Kanji	Ammani	Pachai
Kasthuri	Balamani	Ramadas
Koneri	Danappan	Rupani
Mangai	Ganapathi	Savari
Mogammal	Elumalai	Tangani

"May I ask for your kind assistance in getting a proper register of Tamil names prepared, with as little delay as possible? I feel sure that such register when tabulated and printed will be found most useful to all employers of Tamil labour.

"To familiarize the Tamil cooly with the names adopted for their estates, especially in case of those estates which will have to

change their name (inevitable in a good many cases, I am afraid) I would suggest that the name be painted on boards and displayed in the cooly lines, and be printed on note paper and given to K. P's. and kanganies, etc.

"At the head of your list, will you please give the Tamil names of the district and sub-districts, or Post Offices and Railway Stations.

"Thanking you in anticipation,

"I am, etc.,

"(Sd.) F. G. HARVEY,

"*Chairman, P.A.M.*"

Mr. FISH says that the Kuala Selangor Association had considered this question and were afraid that a change of name by an estate might prejudice recruiting.

The SECRETARY says that the Kapar District Planters' Association had written to say that out of 19 estates in the district 18 were known by the mile-stone.

Mr. HARVEY hopes that all members would do their best. Of course there were difficulties as they knew but they should be overcome.

12.—WAGES IN LIEU OF NOTICE.

Mr. JEAVONS wishes to know whether it was legal for a cooly who had absconded to remit a sum of money through the post to cover a month's wages in lieu of notice.

Mr. BRUCE says this question had been decided in the affirmative by the Kuala Kubu Magistrate some time ago in the case of a cooly at Batang Kali Estate.

Mr. SPEARMAN ARMSTRONG gives details of cases but is ruled out of order.

Mr. HENDRIE states that the Assistant Controller of Labour in Klang held that this was not legal.

Mr. HARVEY asks whether they would wish the question to be referred to their Legal Advisers.

Agreed to.

13.—CHINESE LABOUR.

Papers in connection with a recently formed Chinese Labour Committee in Negri Sembilan are laid on the table.

14.—FOOD.

The SECRETARY submits the following letter and places on table the Government Rice Control Scheme of 9th June, 1919, and the Food Production Ordinance of 1919:

"KUALA LUMPUR,
"*5th May, 1919.*

"*Letter addressed to*

"E. S. Hose, Esq., Director of Food Production,
"S.S. and F.M.S., Kuala Lumpur,
and
"The Hon'ble Mr. F. S. James, Food Controller, Singapore.

"SIR,

"I have the honour to inform you that at the Annual Meeting of this Association held on the 30th ultimo the following resolution was carried unanimously, viz.: 'That this Association is desirous that the Food Controller and Director of Food Production should consider the advisability of granting a State bounty on every gantang of padi delivered at the Mills for the 1920 crop as an inducement to Malays and others in order that every available acre of padi land throughout Malaya may be brought under cultivation during the current year.'

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*"

Mr. DUDLEY on behalf of the Kuala Selangor District Planters' Association moves that a price be fixed for selling ragi.

Mr. ARMSTRONG says that the Kuala Lumpur District Planters' Association had passed a similar resolution.

Mr. HARVEY believes that it had been proposed that the State should sell rice, flour and ragi to their coolies at an average rate of 45 cents per gantang, but it was of course impossible to ensure uniformity in all districts.

Mr. BENNETT thinks that the Kuala Selangor resolution really meant that they wished the Government to control ragi in the same way as they controlled rice.

Mr. DUDLEY agrees but does not wish to press the matter as he fully realized that the Food Controller had at present his hands full.

Mr. HARVEY says he had just received a letter from Mr. Physick who had done a great deal to produce order out of chaos:

"PENANG,
"*22nd June, 1919.*

"PARBOILED RICE.

"DEAR HARVEY,

"I am writing this in Penang after a prolonged meeting with the Rice Control Authorities here.

"The enclosed notice, which will shortly appear in the papers, practically explains the position and if you will read this in conjunction with my previous advices, I think the position will be clear to you.

"I enclose copies of the new forms to be used, for your further information.

"Estates require an Import and Retail Licence (obtainable from District Officers or Chairman, Sanitary Boards). With regard to supplies, all should communicate direct with the Agent, Food Controller, Penang, and not through their Agents or others.

"Firms cannot be registered for supplies to estates.

"The form of Delivery Order provides the necessary forwarding instructions, etc.

"No parboiled rice will be issued except against presentation of this Delivery Order with payment.

"Delivery Orders will be issued from Penang to everyone on the Register in proportion as supplies are available.

"Great care will be taken that the Register is correctly compiled so that distribution may be fair to all.

"Perhaps you would think it advisable to explain the plan at your meeting of the Planters' Association of Malaya on Wednesday.

"Please make it quite clear that everyone requiring supplies must send in the revised form 'A' no matter how many other 'A' forms they may have already sent in!

"Yours, etc.,

"(Sd.) F. S. PHYSICK.

"F. G. HARVEY, ESQ.,
"PETALING, SELANGOR."

Mr. BELL points out that at present rice was being allotted on the returns made by them to the Labour Department but these did not include any Tamils who were in hospitals or who were not included in the check-roll, etc.

Mr. HARVEY agrees that they should protest against this labour return basis and he undertakes that a strong letter be written to the Agent of the Food Controller in Penang on the subject.

(Applause.)

Mr. FISHER asks whether there was any truth in the rumour that 5,000 bags were lying in a store in Kuala Lumpur and were getting bad.

Mr. HARVEY had enquired into the matter and the answer was in the negative.

Mr. TOBUTT wishes to bring to the notice of the Association that there was a regular shortage of 10 per cent. of rice in bags. Where did that shortage occur? A 30-gantang bag should theoretically weigh 1.75 pikuls but actually it never weighed more than 1.70.

Mr. HARVEY says the Controller of Labour calculated six catties to be a gantang of rice. He might add that supplies of rice had hitherto been held back in order to force firms to unload who had been hoarding stocks. He feels that after the 1st of July the position would be very much easier.

Mr. FANE asks why the retail price of sugar had been fixed 10 cents a catty when it could nowhere be purchased for less than 23 cents. Surely such official regulations should either be enforced or withdrawn and he thinks the Government should be addressed to that effect.

Mr. GOOCH seconds but does not wish the regulation to be abolished but to be enforced. The present position only brought the Government to ridicule.

Mr. HARVEY says that unfortunately the price of sugar depended on the price importers had to pay in Java and for the time being there it was impossible to carry out the original regulation.

Mr. KENNEDY confirms this statement and says that every shipment of sugar varied in price.

Mr. TOBUTT believes that prices would go still higher.

Mr. BENNETT deprecates rescinding regulations which at least tended to keep prices to some extent down.

Mr. SOUTER wishes to know whether the market reports of prices which were issued from time to time were fixed by Government. He believes that formerly it regulated these prices. Could this now not be taken over by the Food Controller ?

Mr. TOBUTT favours rather the fixing of a profit than the fixing of a price.

Mr. HARVEY hopes that Mr. Fane's resolution will not be carried. As they knew the Food Controller was now hard at work to fix the most important food question, viz., that of rice. Once that had been settled no doubt he would turn his attention to other articles of food.

Mr. FANE withdraws his proposal.

Mr. MCCULLOCH enquires what had been done in the matter referred to by him on page 32 of the last minutes.

Mr. HARVEY replies that this matter was still under consideration.

15.—KUALA SELANGOR FLOODS.

The SECRETARY reports having written to the Under Secretary as instructed :

"KUALA LUMPUR,
"*28th May, 1919.*

"SIR,

"I have the honour to refer to the flooding of the Kuala Selangor-Rawang Road between the 33rd and 42nd mile. A deputation of estates managers concerned waited on the Resident of Selangor on 26th November, when the Resident promised that any proposed scheme would be treated as urgent work. The Hon'ble Mr. R. C. M. Kindersley raised the question at the Federal Council Meeting held in December when it was understood that a report would be called from the Irrigation Engineer.

"I am now instructed by my Standing Committee to point out that the general impression gained by them is that the seriousness and urgency of the case is not fully realized nor the absolute necessity of obtaining a report from an expert who is a specialist on the subject.

"I am therefore instructed to submit that Mr. H. S. I. Smail be forthwith instructed to prepare a special report and formulate a definite scheme.

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"UNDER SECRETARY,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

Mr. DUDLEY says that the matter really was of the greatest urgency.

Mr. FISH suggests that a reminder be sent to Government asking for a reply.

16.—RAILWAY MATTERS.

The SECRETARY submits the following correspondence:

"KUALA LUMPUR."
"*21st May, 1919.*

"No. G.M.R. 3820/17.

"SIR,

"I have the honour to refer to previous correspondence on the subject of additional constables at certain stations in connection with the storage of rubber at night after the train has gone, and to inform you that it has now been arranged for ten stations to be provided with additional constables from 1st June, 1919. The men will be sent to the following stations:

Sungkai	Labu
Petaling	Kuala Sawah
Sungei Way	Silian
Batang Benar	Batang Malaka
Sepang Road	Labis

"2. Arrangements will commence on the 2nd June, 1919. As soon as the Assistant Commissioner of Railway Police is able to provide men for the other remaining stations, I will advise you further.

"I have, etc.,
"(Sd.) P. A. ANTHONY,
"*General Manager, F.M.S. Railways.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*22nd May, 1919.*

"SIR,

"I have the honour to acknowledge receipt of your letter 3820/17 of the 21st inst. and to thank you for its contents which I will bring to the notice of the members of this Association in due course.

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"GENERAL MANAGER,
"F. M. S. RAILWAYS,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*29th May, 1919.*

"SIR,

"I am instructed by my Standing Committee to ask when your Department hopes to be in a position again to revert to pre-war passenger rates and train services.

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

GENERAL MANAGER,
"F. M. S. RAILWAYS,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*6th June, 1919.*

"No. G.M.R. 2975/19.

"SIR,

"In reply to your letter of the 29th ultimo I have the honour to inform you that it is our intention to restore the pre-war passenger rates and train services as soon as the locomotives now on order with Messrs. Baldwin & Co., Philadelphia, U.S.A., arrive in this country and can be put into service. They are due for delivery in America at the end of this month and there is good reason to anticipate that they will be running before the end of the year.

"2. As regards the restoration of the pre-war Sunday service, I have suggested to the Government that the opinion of your Association, the Chamber of Commerce and other leading bodies should be obtained before a decision is made as to whether the same passenger service should be given on Sundays as on week-days, as was the case previous to the war.

"I have, etc.,
"(Sd.) P. A. ANTHONY,
"*General Manager.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
KUALA LUMPUR."

"KUALA LUMPUR,

"No. 3209/1919. "*30th May, 1919.*

"SIR,

"I am directed to address you with reference to curtailment of passenger traffic, more particularly on Sundays, over the Federated Malay States Railways which it was found necessary to introduce in 1917, in order to economize in engines and rolling stock.

"The Railway Administration hopes to receive and be able to use before the end of this year new locomotives now being made, and will then be in a position to revert to the time table as it stood before the war.

"The curtailment of the Sunday passenger service has been welcomed by the Railway Administration not only as effecting the object with which it was introduced, but also as giving an opportunity of rest to the station staff who otherwise have to work for seven days in the week; and it is believed that now that the public has become accustomed to the limited Sunday service and is in the habit of making its travelling arrangements accordingly, a continuance of the restrictions would not cause inconvenience.

"The Chief Secretary will, however, be obliged if he may be favoured with the views of your Association as to the desirability of resuming the full Sunday passenger service as obtaining before the war, as soon as circumstances permit the Railway Administration to do so.

"I am to add that as soon as the additional locomotive power referred to above is available it is proposed to introduce a Mail Service between Penang and Kuala Lumpur at night.

"I have, etc.,

"(Sd.) W. MACKRAY,

"*Acting Under Secretary to Government, F.M.S.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

Mr. TOBUTT points out that Lower Perak were very much affected by the cessation of Sunday traffic. As a consequence it was impossible for anybody to get away for a week-end in that district. His Association was asking to press for the restoration of the Sunday services.

Mr. HARVEY suggests that people who wanted to go away for a week-end should go on Saturday and return on Monday (Laughter.)

Lower Perak of course was not alone affected but all branch lines were suffering similarly.

Mr. BUXTON is instructed to ask for at least one train on Sundays which would stop at all stations.

Mr. BENNETT proposes that the pre-war Sunday service be restored as the roads were in such a rotten condition that one had to go by train.

Mr. BAILEY seconds the proposal, which is carried unanimously.

17.—SMALL CHANGE.

The SECRETARY submits the following correspondence:

"KUALA LUMPUR,
"*29th May, 1919.*

"*Letter addressed to*

"The Agent, Chartered Bank, Kuala Lumpur.
" Mercantile Bank of India Limited, Kuala Lumpur.
" Hongkong and Shanghai Banking Corporation, Kuala Lumpur.

"DEAR SIR,

"Complaints as to scarcity of small change continue, and my Standing Committee would be much obliged if you could favour them with your views on this subject.

"Thanking you in anticipation,

"Believe me, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*"

"KUALA LUMPUR,
"*29th May, 1919.*

"DEAR SIR,

"With reference to your letter of date regarding the shortage of small change, we must refer you to the Treasurer, Federated Malay States, as the position as far as the Federated Malay States is concerned is entirely in his hands. Such supplies as we receive from Singapore are distributed by us throughout the country in accordance with instructions received from the Treasury here.

"I am, etc.,
"(Sd.) C. A. PEARCY,
"*for Agent,*
"*Chartered Bank of India, Australia and China.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*30th May, 1919.*

"DEAR SIR,

"We are in receipt of your letter of 29th instant requesting a statement of our views on the subject of the scarcity of small change.

"The shortage first began to be felt when the price of silver rose to such an extent that it paid to export our coin to China. We are of the opinion that the steps taken by the authorities to prevent this export were inadequate, and that large quantities continued to leave the country until the reduction in the fineness of the coin rendered this traffic profitless.

"As soon as the shop-keepers and kedehs on estates and mines realized that they could not obtain from the Banks their usual supplies they tried to safeguard themselves by stopping paying in regularly their takings of small change, in other words they hoarded it, and it ceased to circulate except in the immediate neighbourhood of the shop, stall, or kedeh as the case might be. In many cases planters and miners had relied on their local kedehs for certain of their requirements in this connection, and when the hoarding began they applied to the Banks for larger supplies than previously, failing in this, they in turn began to hoard what they could and to pay the coolies to the nearest dollar.

"In our opinion this hoarding is still going on and will continue until drastic measures are adopted to put a stop to it.

"We are of the opinion that it will be found that not only shop-keepers are hoarding but many individuals in the more remote parts of the country. The amount held by each individual may not be much, but the aggregate accounts for the present difficulties.

"We have recently received $10,000 worth of 10-cent notes and these are being issued freely to estates, but owing to the very large number of forged 10-cent notes in circulation we find the natives are reluctant to handle these.

"We take the liberty to suggest to your Committee that it would be greatly to the advantage of the Federated States were the Treasury here entirely independent of the Colonial Treasury. When the crisis arose the officer holding the position of Treasurer, Federated Malay States, was practically speaking new to Malaya and ignorant of local conditions and requirements, and he appeared to us to rely entirely upon the advice of the Hon'ble the Colonial Treasurer.

"The officer at present administrating the Treasury here has many years' experience and a wide knowledge of Malaya, and it seems to us more than a pity that his every action should be hampered by subjection to the Colonial Official.

"Yours, etc.,

"(Sd.) JOHN S. FERRIER,

"*Agent, Mercantile Bank of India, Ltd.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*4th June, 1919.*

"DEAR SIR,

"I am in receipt of your letter of the 29th May, and in my opinion beg to state there is still a shortage of subsidiary coins. This is no doubt owing to a large extent to no supplies being available at the moment. The Indian mints, the source from which sub-coin is obtained, have a large local demand to meet, and have also suffered from strikes, etc.

"There is a fair supply of subsidiary notes available, but I think it is generally conceded that although it has met a temporary want the note issue has not been a success. The life of subsidiary notes is very short, and the means of dealing with their cancellation is very limited, which results in many mutilated and worn notes remaining in circulation which should be withdrawn.

"Yours faithfully,
"(Sd.) G. G. S. FORSYTH,
"*Acting Agent.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*3rd June, 1919.*

"SIR,

"I am instructed by my Standing Committee to ask whether you would kindly give us the benefit of your views as to the scarcity of small change about which complaints continue to reach us from all quarters.

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"E. M. BAKER, ESQ.,
"TREASURER, FEDERATED MALAY STATES,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*5th June, 1919.*

"SIR,

"In reply to your letter of 3rd June I regret I do not feel at liberty to give the Association my views on the question referred to unless directed to do so by the Government.

"I have, etc.,
"(Sd.) E. M. BAKER,
"*Treasurer, F.M.S.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*20th June, 1919.*

"SIR,

"I have the honour to inform you that this Association has asked the Treasurer, Federated Malay States, for his views as to the scarcity of small change about which complaints continue to reach us from all quarters.

"The Treasurer, however, has replied that he is unable to comply with our request without having your instructions to that effect, and I am now directed to ask that you will kindly give him permission to do so.

"I have, etc.,
(Sd.) "H. C. E. ZACHARIAS,
"*Secretary.*

"UNDER SECRETARY,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

Mr. HARVEY thinks that the difficulty with small change was not so acute as it had been. Small change apparently was in greater circulation but was not obtainable at the Banks. He need not say that the present small notes were very unsatisfactory. As they had asked for the opinion of the Treasurer of the Federated Malay States they would now have to await that letter before taking further steps.

18.—UNITED MALAYA COUNCIL.

The SECRETARY submits Report dated 5th May drawn up by a Committee appointed by the United Malaya Council embodying suggestions for the revision of the United Malaya Council Rules. (*Vide* appendix.)

Mr. HARVEY would propose that the Report be adopted.

Mr. MCCULLOCH says that according to these revised rules there would be no Committee and that apparently the whole body would be reduced to the status of a Committee. Even so it was not clear who would initiate now any action. He would propose that in paragraph 4, "35" be substituted for "28" as he considers the present number much too small.

Mr. CAMPBELL feels grave apprehensions as to the form of electing the Planters' Association of Malaya delegates to the United Malaya Council. Johore could only be represented through Planters' Association of Malaya, and although Johore paid the third largest subscription to the Planters' Association of Malaya it was quite possible that all the delegates might be chosen from Kuala Lumpur and perhaps Bagan Serai. It seemed to him that to make such an election fair the whole Peninsula should be divided into five zones and each zone elect one representative.

Mr. HARVEY points out that the method of electing the delegates need not now be discussed as the Rules had not yet been adopted by the United Malaya Council, but Mr. Campbell's suggestion was a valuable one and would no doubt be borne in mind when the point came up for discussion at a future meeting.

Mr. JEAVONS seconds the adoption of the Revised Rules as submitted subject to Mr. McCulloch's amendment, and this proposal is carried.

19.—BROWN BAST.

Mr. HARVEY regrets that the information *re* recommendations of the Brown Bast Investigation Committee were published so late; usually the minutes of their meetings took a month before they were published. He suggests that earlier information should be given.

Mr. LEWTON-BRAIN says that this would be done in future.

20.—SECRETARY.

Mr. HARVEY says that he had to intimate that their Secretary, Mr. H. C. E. Zacharias, wished to retire from the post. He had been Secretary for the past 15½ years and during that time he had never once himself had any reason to complain about the manner in which he had performed his duties nor had he heard any member of the Association say that Mr. Zacharias did not carry out his work in anything but an excellent manner. He would like this meeting to place on record the Association's appreciation of his work and express their regret at the circumstances which bring about his retirement.

As regards a successor, it was very difficult to find one as it required much special knowledge and local experience and conditions. In any case he thinks that it would be impossible for this meeting to do anything in the matter and he would therefore suggest that full authority be given to the Standing Committee both to select a successor and to fix an honorarium to Mr. Zacharias for his long services. (Applause.)

Mr. TAYLER would like to add his own deep and sincere appreciation of Mr. Zacharias' services and it was with the very keenest regret that he heard of his decision to retire from his work in regard to which he possessed almost encyclopædic information. He still hopes that that decision was not irrevocable and that after a good holiday he would see his way to return to this country where he could assure him of a hearty welcome by all members of this Association. (Applause.)

As regards an honorarium he would like to add a suggestion, namely, that in addition to what the Association might offer voluntary additions should be considered by such people as himself, for instance, he would be very glad to have an opportunity of thus showing their appreciation.

Mr. McCulloch has the greatest pleasure to support previous two speakers. He had seen a great deal of the work done by Mr. Zacharias and although it was quite true that he had been paid for the work he had done yet he had done it in a manner which money could not buy, as for him it had been a work of life. He feels sure that it will be difficult to find a man to take on the work and carry it out in the way Mr. Zacharias had done and he would associate himself with Mr. Tayler in asking Mr. Zacharias to re-consider his decision and to return to this country from which he wished to retire.

Mr. Harvey proposes and Mr. Tayler seconds, and it is carried unanimously "that the Standing Committee be authorized to take steps to fill the vacancy caused by the retirement of Mr. Zacharias from the position of Secretary, to consider the matter of an honorarium to him and of a voluntary testimonial by the planters of Malaya."

The meeting terminates at 12.30 p.m.

H. C. E. Zacharias,
Secretary.

Abstract of Meteorological Readings in the various Districts of Malaya for the month of March, 1919.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kelantan, Kota Bahru	...	150.0	82.9	90.83	72.67	18.16	76.9	.810	72.9	72.	...	1.56	1.06
Pahang, Kuala Lipis	...	...	82.43	90.93	74.22	16.71	77.08	...	...	...	...	5.90	2.24
Johore, Johore Bahru	...	...	...	91.00	73.88	...	...	...	...	...	...	16.26	2.91
Singapore, Kandang Kerbau ...	29.165	162.0	83.6	90.0	75.2	14.8	78.6	.904	...	79.	N.E.	9.79	2.04
Malacca, Durian Daun	29.850	144.0	82.0	90.0	75.0	15.0	78.0	.910	...	81.	N.E.	7.06	2.36
Negri Sembilan, Seremban ...	...	150.5	81.4	91.5	74.1	17.4	78.8	.923	78.8	78.6	S.W.	13.36	2.40
,, Kuala Pilah ...	...	140.0	81.0	90.1	...	...	77.6	.857	74.9	80.6	...	5.87	1.73
,, Port Dickson...	...	118.9	82.6	88.1	74.8	13.3	74.8	.873	75.1	78.2	...	5.85	1.07
Selangor, Kuala Lumpur ...	29.822	145.6	84.1	90.7	73.3	17.4	76.1	.765	70.0	66.8	N.E.	8.02	3.00
,, Klang	...	...	81.6	86.8	75.0	11.8	77.3	...	...	...	...	8.39	3.42
,, Kuala Selangor ...	...	...	...	90.6	75.6	15.0	...	...	...	...	...	3.53	1.86
,, Rawang	...	...	...	93.7	...	...	...	...	...	...	...	6.62	1.44
Perak, Telok Anson	...	...	82.92	93.0	73.0	20.0	78.16	.900	...	81.0	...	11.96	2.47
,, Ipoh	...	...	83.80	96.0	69.0	27.0	77.57	.861	74.44	75.0	...	14.48	3.18
,, Taiping	...	115.0	83.01	93.0	70.0	23.0	78.26	.903	...	81.0	...	15.39	2.00
,, The Cottage	...	...	...	...	...	...	...	...	...	...	...	19.65	3.85
,, Parit Buntar	...	...	83.71	94.0	68.0	26.0	78.20	.892	...	77.0	...	4.88	1.49
Penang, Georgetown	29.823	149.0	84.9	93.8	73.2	20.6	77.8	.876	69.6	71.4	N.W.	6.65	2.51
Kedah, Alor Star	...	...	...	...	...	...	...	...	...	...	...	5.72	2.20
Perlis, Kangar	...	...	...	93.58	73.0	20.48	...	...	...	...	...	3.42	1.70

Abstract of Meteorological Readings in the various Districts of Malaya for the month of April, 1919.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kelantan, Kota Bahru	...	148.0	84.3	93.03	75.33	17.70	77.8	.826	73.5	70.	...	1.99	.58
Pahang, Kuala Lipis	...	...	82.62	91.26	74.86	16.4	77.13	...	...	...	...	9.24	1.30
Johore, Johore Bahru	...	...	...	90.11	74.21	...	...	...	...	...	...	15.74	2.41
Singapore, Kandang Kerbau ...	29.795	165.0	84.0	89.9	75.4	...	78.3	.930	...	79.	N.W.	9.00	2.97
Malacca, Durian Daun ...	29.846	139.0	82.0	89.0	74.0	15.0	78.0	.944	...	84.	N.E.	11.77	2.08
Negri Sembilan, Seremban ...	...	153.9	80.2	91.6	71.8	19.8	78.1	.923	76.7	82.9	S.W.	10.44	4.40
,, Kuala Pilah ...	...	139.2	81.7	91.0	82.5	8.5	77.5	.864	74.7	79.	...	6.23	4.99
,, Port Dickson...	...	115.8	82.3	88.5	74.6	13.9	78.3	.877	75.2	77.7	...	8.07	2.77
Selangor, Kuala Lumpur ...	29.848	148.2	83.7	90.8	72.9	...	74.9	.721	69.1	64.	N.E.	10.04	1.61
,, Klang	...	...	80.8	85.7	75.1	10.6	77.3	...	...	...	...	11.75	2.87
,, Kuala Selangor ...	...	...	...	89.6	75.5	14.1	...	...	...	...	...	10.09	3.01
,, Rawang	...	...	...	90.7	...	...	...	...	...	...	...	9.78	2.58
Perak, Telok Anson	...	...	82.22	96.0	72.0	24.0	78.21	.912	...	83.	...	10.27	1.49
,, Ipoh	...	...	82.08	95.0	71.0	24.0	77.88	.897	75.30	83.	...	15.66	3.42
,, Taiping	...	112.0	81.09	92.0	69.0	23.0	77.30	.889	...	85.	...	29.52	4.33
,, The Cottage	...	...	...	...	...	...	...	...	...	...	...	21.22	3.26
,, Parit Buntar	...	...	82.91	93.0	72.0	21.0	77.61	.877	...	79.	...	5.55	1.05
Penang, George Town	29.583	146.0	82.8	92.7	73.3	19.4	81.3	.885	69.	78.4	N.W.	6.29	1.01
Kedah, Alor Star	...	...	...	...	...	...	...	...	...	...	...	5.20	1.13
Perlis, Kangar	...	...	...	92.16	74.23	17.93	...	...	...	...	...	5.07	.96